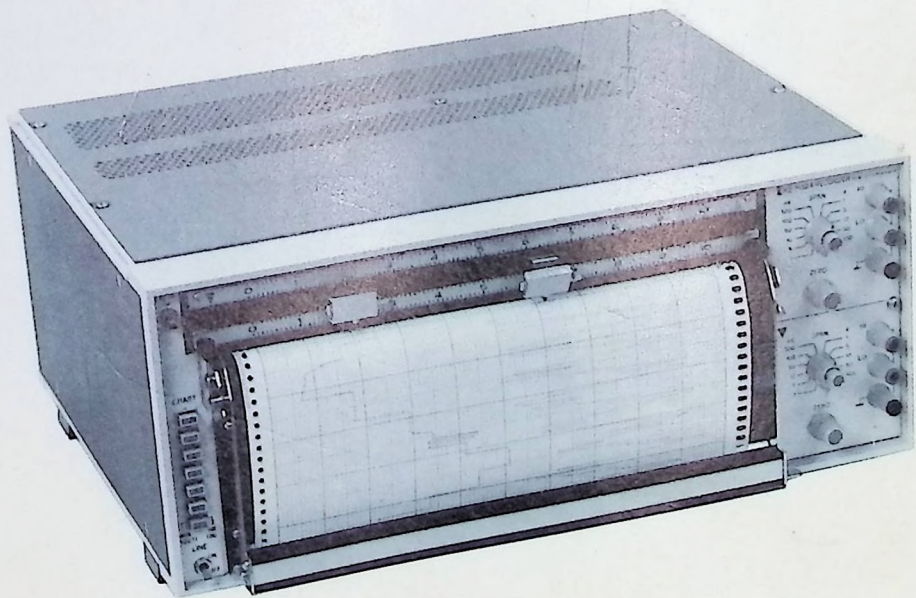


## OPERATING AND SERVICE MANUAL

# STRIP CHART RECORDER

## 7132A/7133A



HEWLETT  PACKARD

## SAFETY

*This product has been designed and tested according to International Safety Requirements. To ensure safe operation and to keep the product safe, the information, cautions, and warnings in this manual must be heeded. Refer to Section I for general safety considerations applicable to this product.*

## CERTIFICATION

*Hewlett-Packard Company certifies that this product met its published specifications at the time of shipment from the factory. Hewlett-Packard further certifies that its calibration measurements are traceable to the United States National Bureau of Standards, to the extent allowed by the Bureau's calibration facility, and to the calibration facilities of other International Standards Organization members.*

## WARRANTY

This Hewlett-Packard product is warranted against defects in materials and workmanship for a period of 1 year from date of shipment. During the warranty period, HP will, at its option, either repair or replace products which prove to be defective.

For warranty service or repair, this product must be returned to a service facility designated by HP. However, warranty service for products installed by HP and certain other products designated by HP will be performed at Buyer's facility at no charge within the HP service travel area. Outside HP service travel areas, warranty service will be performed at Buyer's facility only upon HP's prior agreement and Buyer shall pay HP's round trip travel expenses.

For products returned to HP for warranty service, Buyer shall prepay shipping charges to HP and HP shall pay shipping charges to return the product to Buyer. However, Buyer shall pay all shipping charges, duties, and taxes for products returned to HP from another country.

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NO OTHER WARRANTY IS EXPRESSED OR IMPLIED. HP SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OR MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

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THE REMEDIES PROVIDED HEREIN ARE BUYER'S SOLE AND EXCLUSIVE REMEDIES. HP SHALL NOT BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, WHETHER BASED ON CONTRACT, TORT, OR ANY OTHER LEGAL THEORY.

## ASSISTANCE

*Product maintenance agreements and other customer assistance agreements are available for Hewlett-Packard products.*

*For any assistance, contact your nearest Hewlett-Packard Sales and Service Office. Addresses are provided at the back of this manual.*





OPERATING AND SERVICE MANUAL

**7132A/7133A STRIP CHART RECORDER**

SERIAL PREFIX: 1326A

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16399 W. BERNARDO DRIVE, SAN DIEGO, CALIFORNIA 92127





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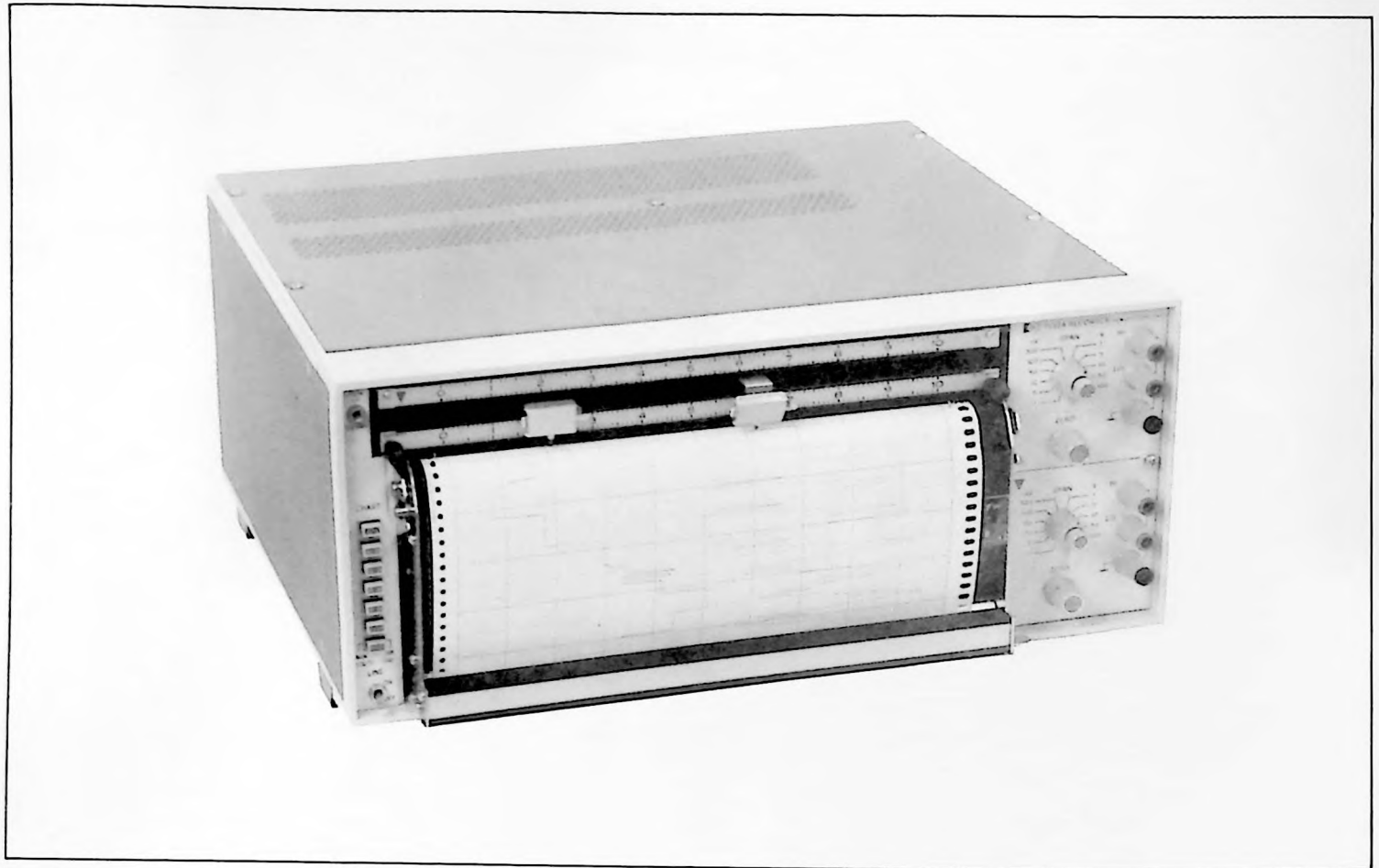


Figure 1-1. Model 7132A Strip Chart Recorder

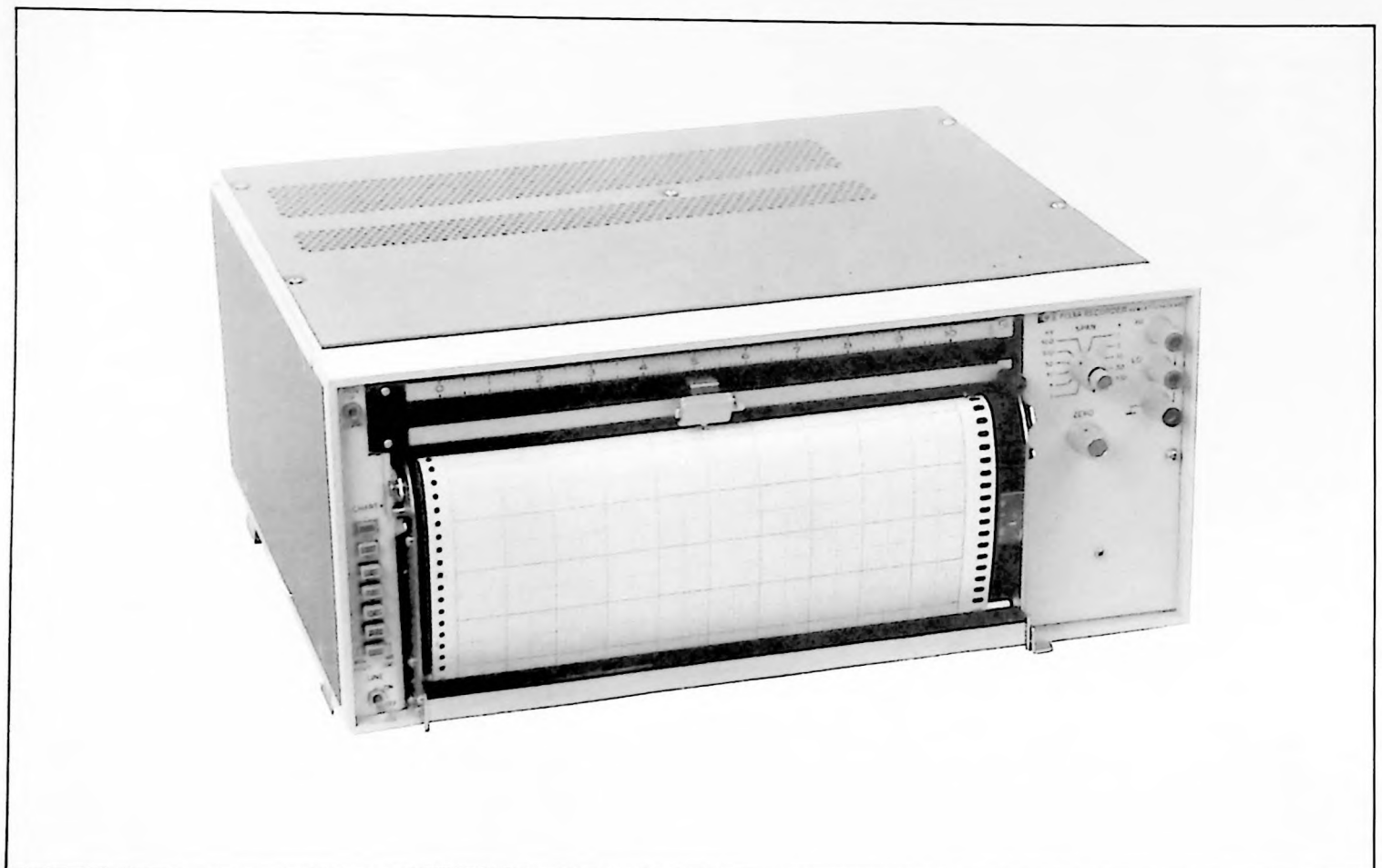


Figure 1-2. Model 7133A Strip Chart Recorder



## SECTION I

### INTRODUCTION

#### 1-1. DESCRIPTION.

#### 1-2. BASIC FRAME.

1-3. The Models 7132A and 7133A Strip Chart Recorders are general purpose laboratory instruments specifically designed to plot cartesian coordinate graphs in a rectilinear trace. The 7132A contains two independent pen drive systems whereas the 7133A accommodates a single pen drive system. The pen(s) horizontally traverse the top of the chart, allowing six inches of vertical recording display. Pen clearance for the two-channel model is 0.1 inch (2 mm). Both channels are capable of full scale travel. The 7132A and 7133A are equipped with a multiple-span attenuator (the 7132A has an attenuator for both channels) with eleven input range spans from 1 mV to 100V in a 1 - 5 - 10 sequence with vernier. Multiple chart speeds of 1, 2, 4, 6 inches per minute, and 1, 2, 4, 6 inches per hour are standard on these models. Standard chart rolls, with a 10-inch writing width, feed from the top to the bottom over a platen which may be tilted at two additional angles. These models are equipped with rack mounting brackets. Figures 1-1 and 1-2 depict the two models in a general configuration.

1-4. The Models 7132A and 7133A are equipped with the following standard features:

a. Remote Chart On-Off that allows the chart drive to be turned on and off by an external contact closure for unattended operation.

b. Remote Pen Lift that raises the pen by means of an external contact closure. When this contact closure is opened, the pen will lower if the front panel switch is set in the down position.

#### 1-5. MODEL — MANUAL INFORMATION.

1-6. These instruments have a two-part serial number. The first four digits and the letter comprise the serial number prefix (1326A for the 7132A and 1326A for the 7133A). The last five digits form the sequential suffix that is unique to each instrument. The contents of this manual applies directly to instruments having the same serial number prefix(es) as listed under SERIAL NUMBERS on the title page. An instrument manufactured after the printing of this manual may have a serial prefix that is not listed on the title page. This unlisted serial prefix indicates that the instrument is different from those documented in this manual. The

manual for this instrument is supplied with a yellow Manual Changes Supplement that contains "change information" that documents the differences. In addition to change information, the supplement may contain information for correcting errors in the manual. To keep this manual as current and accurate as possible, Hewlett-Packard recommends that you periodically request the latest Manual Changes Supplement. The supplement for this manual is keyed to this manual's print date and part number, both of which appear on the title page. Complimentary copies of the supplement are available from Hewlett-Packard. For information concerning a serial number prefix not listed on the title page or in the Manual Changes Supplement, contact your nearest Hewlett-Packard Sales/Service Office. The addresses are listed on the last two pages of this manual.

#### NOTE

On the front cover of this manual, below the manual part number, is a Microfiche part number. This number may be used to order 4 x 6-inch microfilm transparencies of the manual. The microfiche package also includes the latest Manual Change Supplement, as well as all pertinent Service Notes.

#### 1-7. SPECIFICATIONS.

1-8. Table 1-1 lists the specifications supplied with the recorder. Figures 1-3 and 1-4 illustrate the outside dimensions of the models. Table 6-2 lists additional items and accessories that may be ordered when needed.

#### 1-9. OPTIONS.

1-10. The options available for the Models 7132A and 7133A are listed in Table 1-2. The following paragraphs describe these options; they may be ordered only at time of recorder purchase.

#### 1-11. METRIC SCALING — OPTION 001.

1-12. This option converts the recorder from English to Metric by replacing the upper and lower scales, and paper drive sprockets.

Table 1-1. Specifications

**PERFORMANCE SPECIFICATIONS**

Input Ranges: Eleven ranges from 1 mV to 100V full scale in 1 - 5 - 10 sequence with overlapping vernier.

Type of Input: Single ended, floating.

Input Resistance: 1 megohm constant on all spans.

Maximum Allowable Source Resistance ( $R_s$ ): 10k ohms.

Normal Mode Rejection (At Line Frequency): Greater than 40 dB.

Common Mode Rejection: Greater than 120 dB at dc and greater than 100 dB ac.

Deadband: 0.1% of full scale.

Response Time: Less than 1/2 second.

Overshoot: Less than 2% of full scale.

Accuracy (Including Linearity and Deadband):  $\pm 0.2\%$  of full scale at 25°C Temp Coefficient  $\pm 0.010\%$  per °C.

Range Accuracy (Including Linearity and Deadband).  $\pm 0.2\%$  of full scale  $\pm 0.2\%$  of deflection at 25°C Temp Coefficient  $\pm 0.01\%$  per °C.

Chart Speeds: Eight Chart Speeds; 1, 2, 4, 6 in./min and hr (2.5, 5, 10, 15 cm/min and hr) plus external input.

Chart Speed Accuracy:  $\pm 0.08\%$  plus end line frequency accuracy.

Zero Set: Provides three full scales of offset.

Environmental (Operation): 0°C to 55°C, less than 95% relative humidity (40°C).

**GENERAL SPECIFICATIONS**

Writing Mechanism: Servo actuated disposable ink pens.

Grid Width: 10 inches or 25 cm.

Chart Length: 100 ft or 30 meters.

Pen Lift: Solenoid operated with remote capability.

Power: 115/230V  $\pm 10\%$ , 60 Hz, 120 VA or 115/230V  $\pm 10\%$ , 50 Hz, 120 VA.

Dimensions: 7 in. high, 17 in. wide, 13-3/8 in. deep (178 x 432 x 340 mm).

Weight: Net, 27 lb (12,3 kg); shipping, 38 lb (17,4 kg).



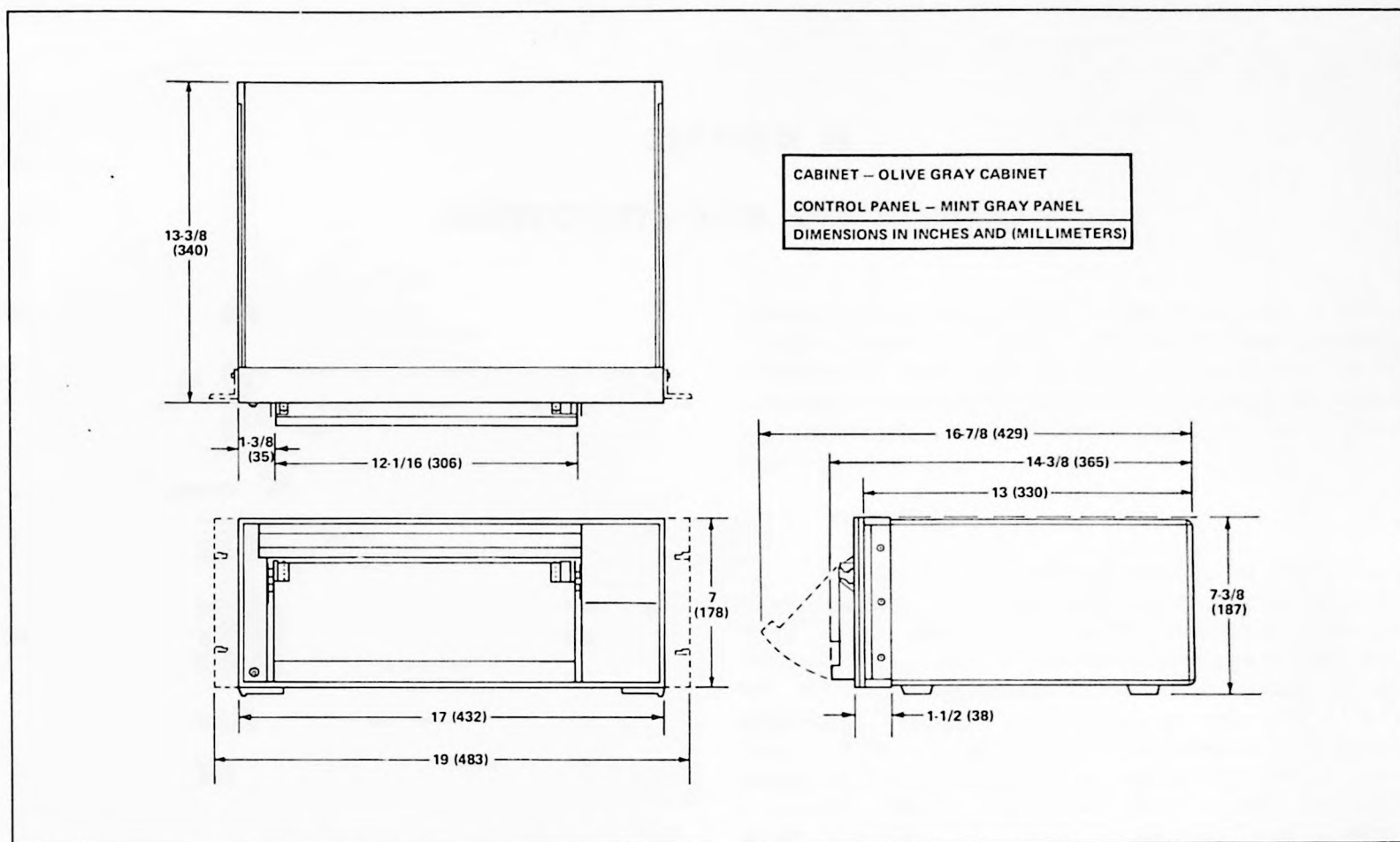


Figure 1-3. Model 7132A/7133A Dimension Drawing

Table 1-2. Options - Models 7132A and 7133A

OPTION	DESCRIPTION
001	Metric Scaling
014	Right Hand Zero - Hard
037	Right Hand Event Marker (Upper Channel)
537	Left Hand Event Marker (Lower Channel)
050	50 Hz Operation
060	60 Hz Operation

1-13. RIGHT HAND ZERO - HARD - OPTION 014.

1-14. The scale is numbered from right to left with zero at extreme right end of scale.

1-15. EVENT MARKER - RIGHT/LEFT - OPTION 037/537.

1-16. Significant events in the recording sequence can be indicated by an external contact closure. A mark is made in the margin of the chart paper. Option 037 is the right-hand event marker (available with either the 7132A or 7133A), Option 537 is the left-hand event marker (available only with the 7132A).

1-17. 50 HZ OPERATION - OPTION 050.

1-18. With this option, the Models 7132A and 7133A operate on a 50 Hz power line.

1-19. 60 HZ OPERATION - OPTION 060.

1-20. With this option, the Models 7132A and 7133A operate on a 60 Hz power line.



## SECTION II

### INSPECTION AND INSTALLATION

#### 2-1. INTRODUCTION.

2-2. This section provides information for incoming inspection, installation, storage, and shipping of the Models 7132A and 7133A Strip Chart Recorders.

#### 2-3. INCOMING INSPECTION.

#### 2-4. MECHANICAL CHECKS.

2-5. Inspect the instrument for mechanical damage, scratches, dents, or other defects. Also check the cushioning materials for signs of severe stress.

#### 2-6. ELECTRICAL CHECKS.

2-7. The electrical performance of the instrument should be verified on receipt. Performance checks, suitable for incoming inspection as well, are presented in Section V.

#### 2-8. DAMAGE CLAIMS.

2-9. If the instrument is damaged in transit, or fails to meet specifications upon receipt, notify the carrier and the nearest Hewlett-Packard office immediately. A list of field offices is conveniently located in the rear of this manual. Retain the shipping carton and padding material for the carrier's inspection. The field office will arrange for replacement or repair of your instrument without waiting for claim settlement against the carrier.

#### 2-10. STORAGE.

2-11. If the instrument is to be stored for a period of time, disconnect power. Install protective pen cap(s)

(located in Accessory Kit) on the main pens. If Event Marker, Option 037/537 is installed, flush capillary system with water and then clean with air. Seal the instrument in a moisture-proof covering with desiccant and repackage in a container similar to the original factory carton.

#### 2-12. SHIPPING.

2-13. Before returning the instrument for any reason, notify the local field sales office of the difficulty encountered, giving the model and serial number of the instrument. They will furnish shipping instructions. Follow the same precautions as stated in Storage Procedures (i.e., remove chart magazine, ink cartridge(s), flush ink lines, ensure pens free of pressure, etc.) before shipping. Finally, wrap the instrument in heavy paper or plastic and surround with three to four inches of shock-absorbing material to cushion and prevent movement inside shipping container. The container should be sufficiently durable to prevent damage to instrument during handling. If in doubt, request a shipping carton from the nearest Hewlett-Packard Sales/Service Office.

#### 2-14. COOLING.

2-15. Cooling is provided by convection. The location or mounting of the instrument must ensure adequate air circulation.

#### 2-16. RECORDER INSTALLATION.

2-17. The Models 7132A and 7133A are rack mounted models, designed for installation in a standard 19-inch rack and require seven inches of vertical space.





## SECTION III

### OPERATING INSTRUCTIONS

#### 3-1. OPERATING REQUIREMENTS.

#### 3-2. INTRODUCTION.

3-3. The basic function of the Models 7132A and 7133A is to graphically present the relationship between a variable voltage and time. The chart's constant rate of travel is determined by the chart speed selection. Before attempting to operate, familiarity with the input requirements and control functions is necessary.

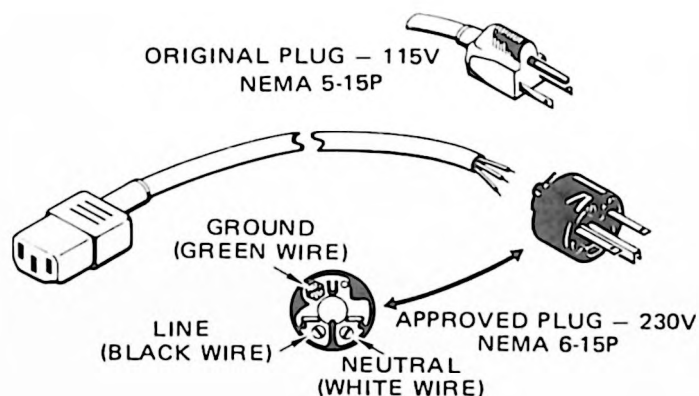
#### 3-4. CONTROLS, CONNECTORS, AND INDICATORS.

3-5. The front and rear panel controls, connectors, and indicators are depicted and described in Figures 3-1 and 3-2.

#### 3-6. ELECTRICAL REQUIREMENTS.

#### 3-7. OPERATING POWER.

3-8. The standard recorder requires a line power source of 115/230V ( $\pm 10\%$ ), 50 Hz (Option 050) or 60 Hz (Option 060) for the 7132A and 7133A models. Option 001 Metric, must be ordered with Option 050 (50 Hz). To operate, set the LINE SELECTOR switch located on the rear panel to agree with the line voltage used. Check that the proper fuse is installed. A 1.5 ampere fuse is required for 115V operation; a .75 ampere fuse is required for 230V operation. The power cord furnished with the instrument complies with National Electric Code requirements only when used for 115V operation. For 230V operation, the power cord must be replaced or modified. To modify the cord, replace the male plug with a NEMA configuration plug for 230V operation. Refer to the following diagram:



#### 3-9. INPUT SIGNALS.

3-10. The recorder's input signals must vary at a rate within the response capabilities of the instrument and have amplitudes within its scale ranges.

#### WARNING

Common mode voltage must not exceed 200V peak maximum. Normal mode voltage must not exceed 100V.

#### 3-11. GROUNDING.

3-12. For safety, the third prong of the power cord must be grounded.

#### WARNING

Care must be taken to ground instrument when operating from ungrounded power sources.

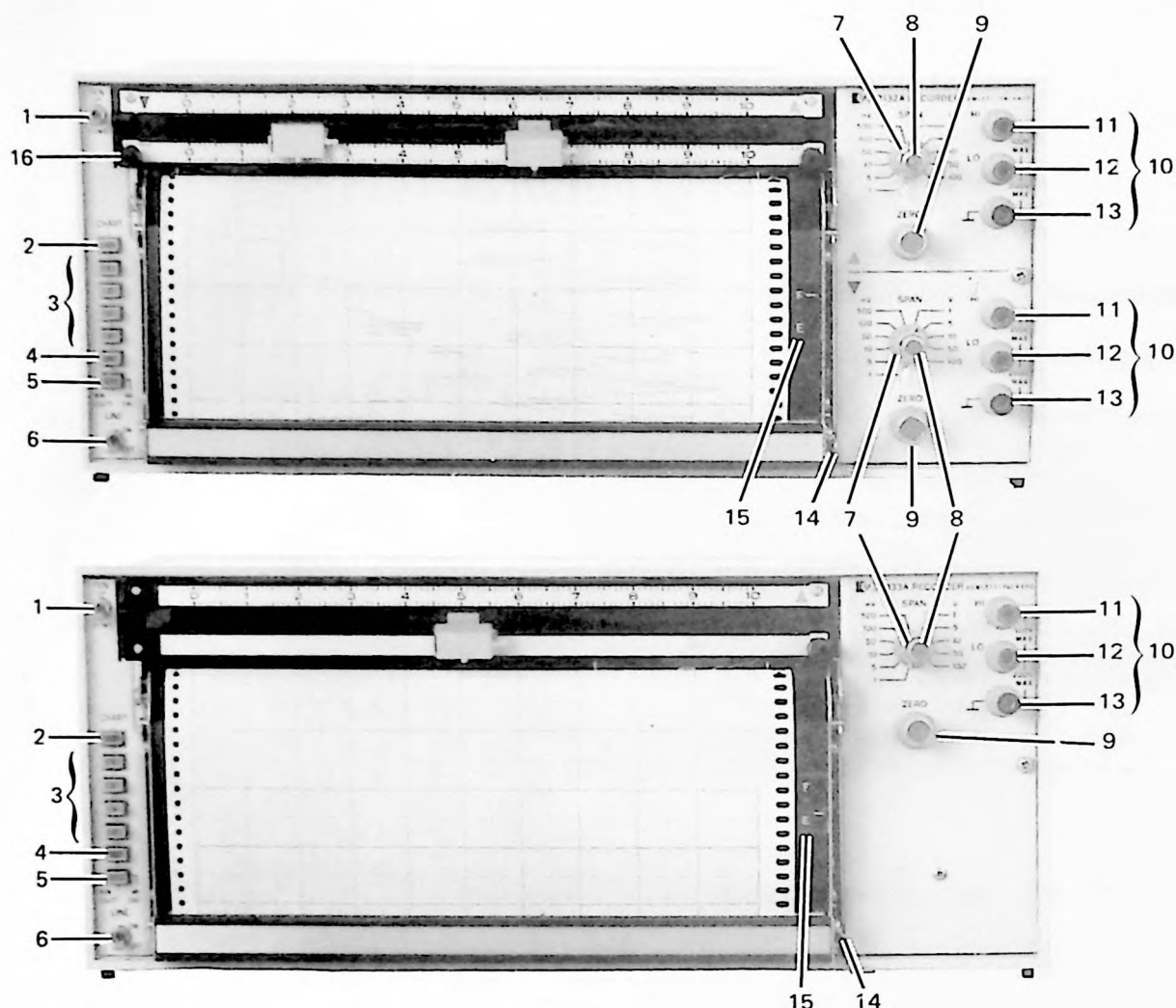
#### 3-13. OPERATING INSTRUCTIONS.

3-14. Before placing the recorder into operation, it is necessary to ensure adequate ink and paper are available. If either or both are needed, the installation procedures are described in the following paragraphs.

#### 3-15. DISPOSABLE PEN INSTALLATION.

3-16. The panel of the Model 7132A is color coded for red ink in the lower channel and blue ink in the upper channel. To install the disposable pen, perform the following steps:

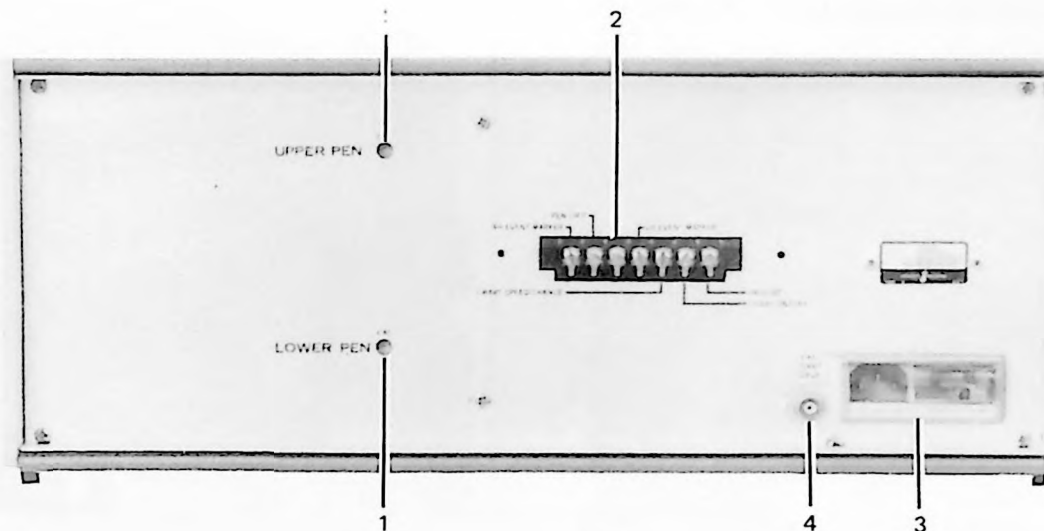
- a. Move the pen lift to the UP position. See Figure 3-1 for location of pen lift.



1. PEN UP/PEN DOWN. With power ON, pen can be switched to UP or DOWN position. With power OFF, pen is automatically in UP position.
2. CHART ON/IN button. When button is in, chart operates at speed selected. A SPEED SELECT button must be in as well.
3. SPEED SELECT buttons. Speeds of 1, 2, 4, or 6 in./minute and in./hour can be selected.
4. EXT button. For use when external input is applied through BNC connector on rear panel.
5. MIN/HR button. Selects speeds of 1, 2, 4, or 6 in. per minute when out; selects speeds of 1, 2, 4, or 6 in. per hour when in.
6. LINE ON/OFF switch. A two-position switch that controls application of ac line voltage to the recorder.
7. SPAN switch. Selects 1 thru 500 mV and 1 thru 100 V full scale span.
8. Gain Vernier Control. Allows continuous gain adjustment between fixed steps of SPAN switch.
9. ZERO control. Adjusts the pen's zero position on the chart.
10. Input Terminals. Accept either open wires or banana type plugs.
11. HI terminal. High input terminal.
12. LO terminal. Low input terminal.
13. GROUND. Input terminal provides connection to instrument frame.
14. Chart Position Lock Lever. Enables user to choose one of three chart magazine positions.
15. EMPTY/FULL indicator. The metal pointer seen through plexiglas indicates amount of chart paper remaining in chart magazine; labeled E (empty) and F (full).
16. PEN PRIMER. The rubber bulb is used to prime the Event Marker (Option 037/537).

Figure 3-1. Front Panel, Models 7132A, 7133A





1. CAL control. A screwdriver-adjustable control allows calibration of instrument.
2. Terminal Strip. One plug-in terminal strip provides the input for several options so labeled on the rear of the instrument. If no options are installed, a filler plate replaces the terminal strip.
3. Power Module. The LINE fuse, LINE VOLTAGE SELECTOR switch, and Input Power Receptacle are included in the module. A 1.5 ampere fuse (slow blow) for 115V or 0.75 ampere fuse (slow blow) for 230V is used. The two-position LINE VOLTAGE SELECTOR switch, seen through clear portion of plastic cover, selects ac line voltage. The FUSE PULL lever extracts the fuse.
4. EXT CHART INPUT. A BNC connector that allows external pulses to control the chart drive speed.

#### CAUTION

Operation of the LINE VOLTAGE SELECTOR switch in the incorrect position may damage the recorder.

Figure 3-2. Rear Panel, Models 7132A, 7133A

- b. Take a disposable pen from package of three provided and grasp pen by projection.
- c. Remove pen tip protector from disposable pen.
- d. Install disposable pen in pen holder with tip pointing downwards and grasping projection to right (see Figure 3-3).
- e. Move pen lift to the DOWN position.

3-17. REMOTE CHART ON-OFF. Check that the contact closure at correct rear terminals stops the chart.

3-18. REMOTE PEN LIFT. Check that contact closure from rear terminal (No. 6 to No. 1) deactivates the pen solenoid and raises the pen. Verify that the pen clears the chart paper in the UP position.

3-19. EVENT MARKERS — INK (OPTION 037/537). Verify that the contact closure at the marked rear terminals and ground (No. 7 to No. 1, and No. 4 to No. 1) activates the solenoids. Confirm the pen alignment with the main pen(s). Each pen requires a separate cartridge. To install the ink cartridge, perform the following steps:

- a. Remove chart magazine. See Figure 3-4.
- b. Push ink cartridge into cartridge holder and onto piercing tube of holder. Ensure cartridge is fully seated. (Bottom of cartridge is flush with end of holder when fully seated.)

#### NOTE

Do not twist cartridge when inserting. Piercer does not go into center of cartridge cap. Piercer goes into the recess area around the center of the cap.

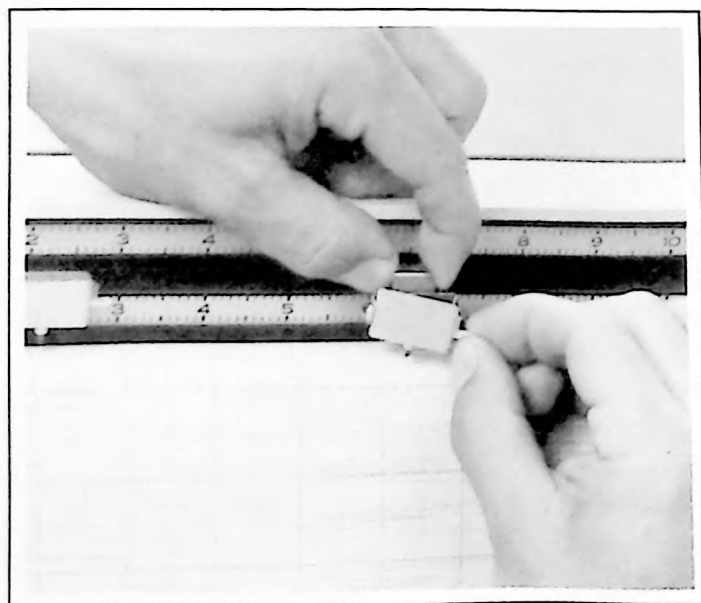


Figure 3-3. Disposable Pen Installation

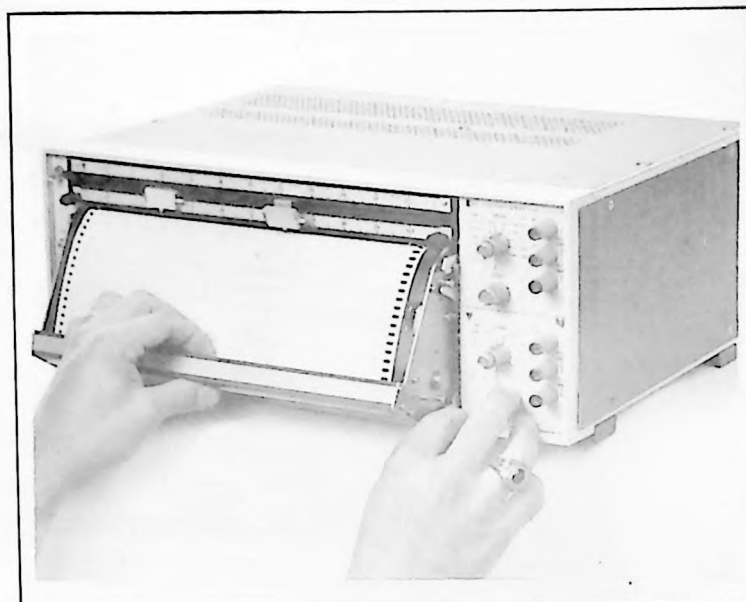


Figure 3-4. Chart Magazine Removal

- c. Prime pen by pressing on appropriate bulb. Depress for at least five seconds with finger over bulb hole and remove finger quickly. Repeat several times until ink flows at pen. Initial priming of ink lines is easier without pen tips installed. See Figure 3-4. Install disposable pen tips by pushing over end of metal pen tubes until seated. Avoid deforming ends of plastic tips when installing.

#### NOTE

Priming is necessary only when a new ink cartridge is installed or pen fails to write after a period of non-use. If priming fails to start ink flow, refer to Section V, Maintenance, Performance Checks, and Adjustments.

- d. Load paper before replacing magazine.

#### 3-20. PAPER LOADING.

3-21. A chart loading diagram is located on the left side of the chart magazine. To load paper, install a standard chart roll in the magazine as follows:

- a. Depress magazine latch. Remove chart magazine from recorder.
- b. Place chart magazine face down (platen down). See Figure 3-5.
- c. Insert supply roll in chart magazine. (Slots in paper roll must align with notches in supply hub.) See Figures 3-6 and 3-7.
- d. Pull paper under first paper guide. See Figure 3-8.
- e. Place chart magazine in upright position. Pull paper up and over platen. See that paper engages with the sprockets. See Figure 3-9.

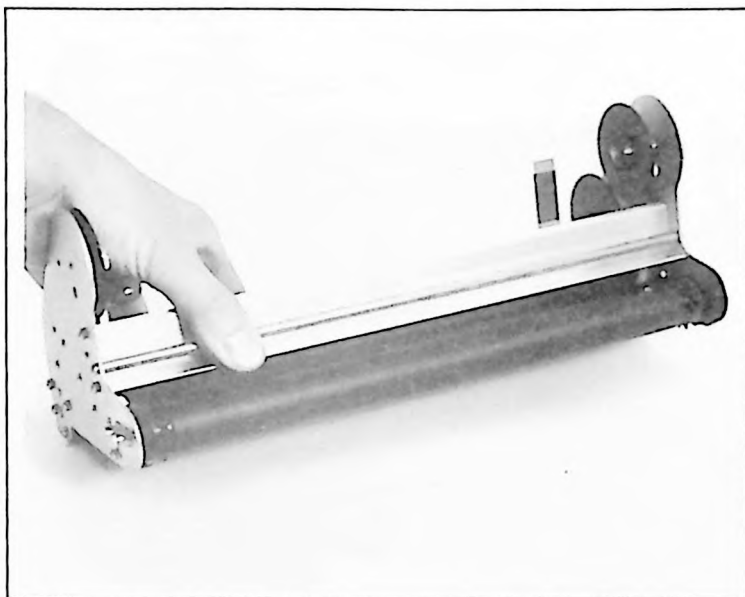


Figure 3-5. Chart Magazine — Face Down

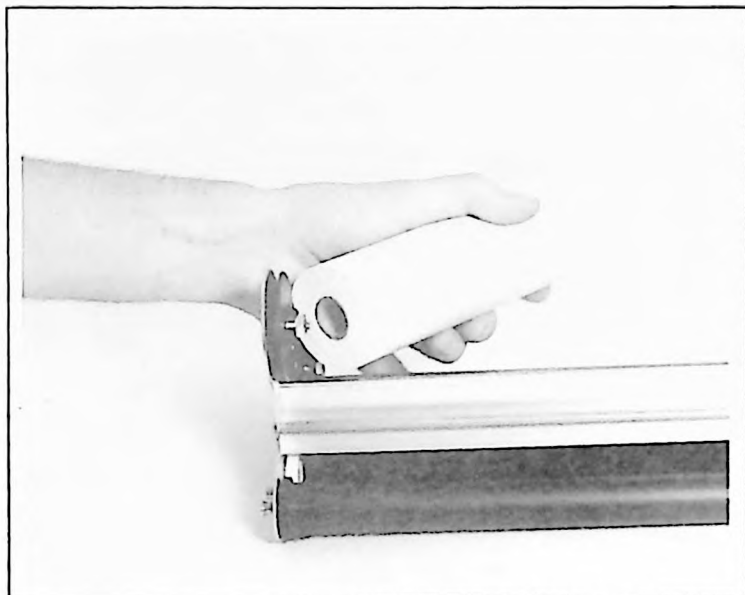


Figure 3-6. Supply Roll Set-Up

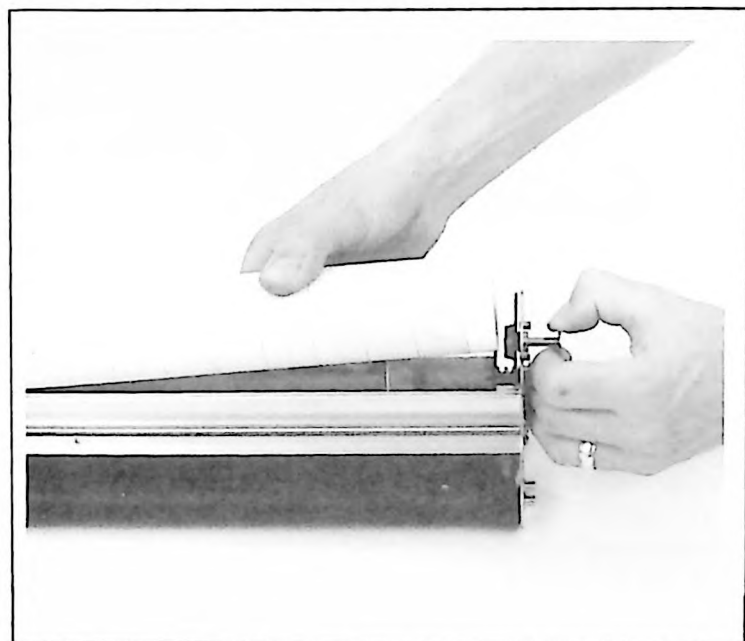


Figure 3-7. Supply Roll Installation

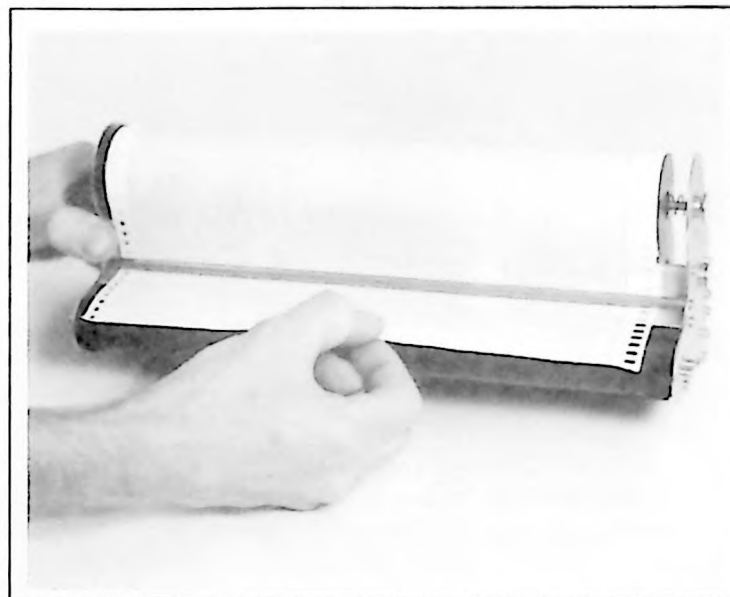


Figure 3-8. Paper Through Paper Guide

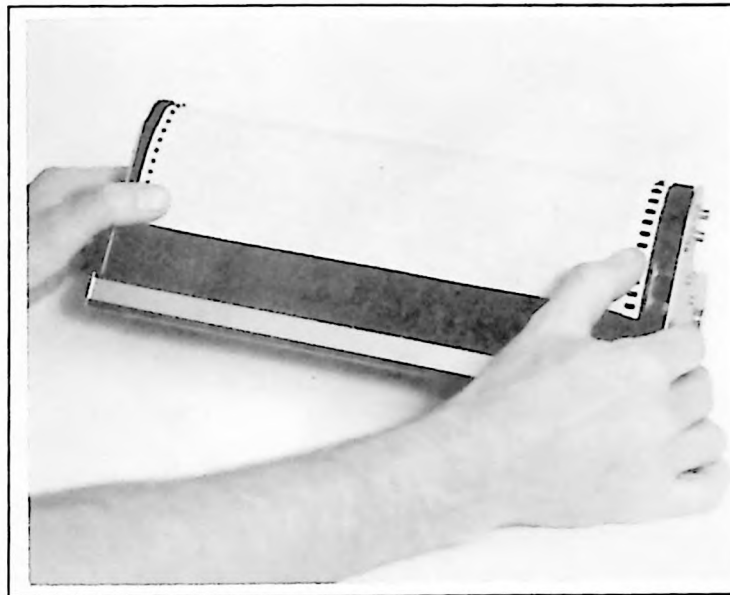


Figure 3-9. Paper/Sprockets Engagement

f. Advance paper down and through feedout roller using thumbwheel. See Figure 3-10. The chart magazine is now ready for external feedout if chart tear-off is desired.

g. If chart rewind is desired, set magazine on face and insert take-up spool. See Figure 3-11.

h. Pull paper over second paper guide roll and tape paper to center of take-up spool (Figure 3-12). Holding magazine and using thumbwheel, advance paper one complete turn on take-up roll, then run finger down length of roll to flatten and crease (Figure 3-13). This ensures a tight take-up roll.

i. Insert magazine in instrument.

### 3-22. OPERATION.

3-23. To operate the recorder after chart paper and ink has been installed:



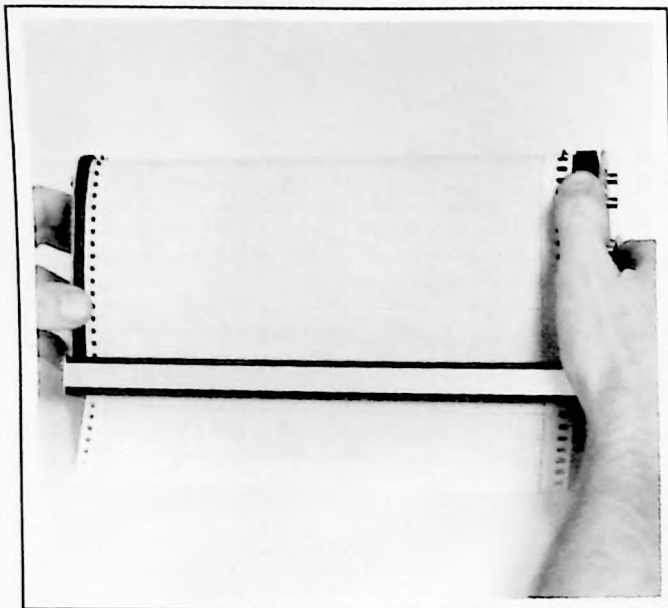


Figure 3-10. Paper Feedout

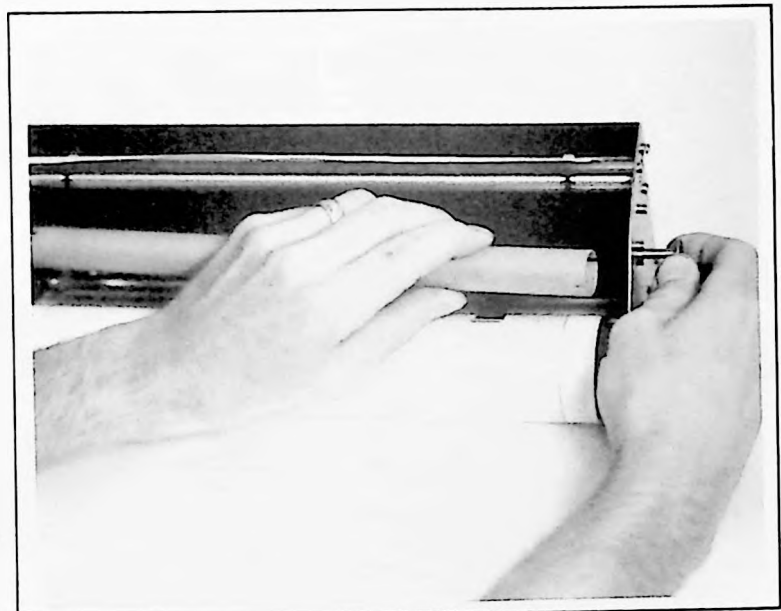


Figure 3-11. Take-Up Spool Installation

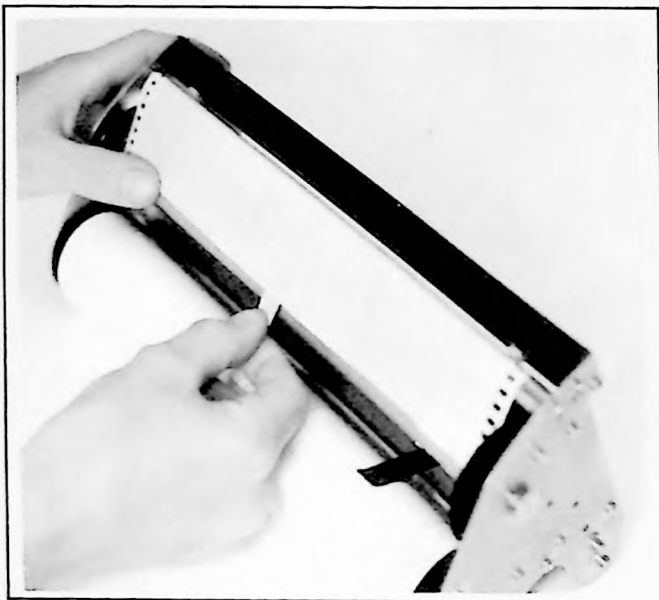


Figure 3-12. Taping Paper to Take-Up Spool

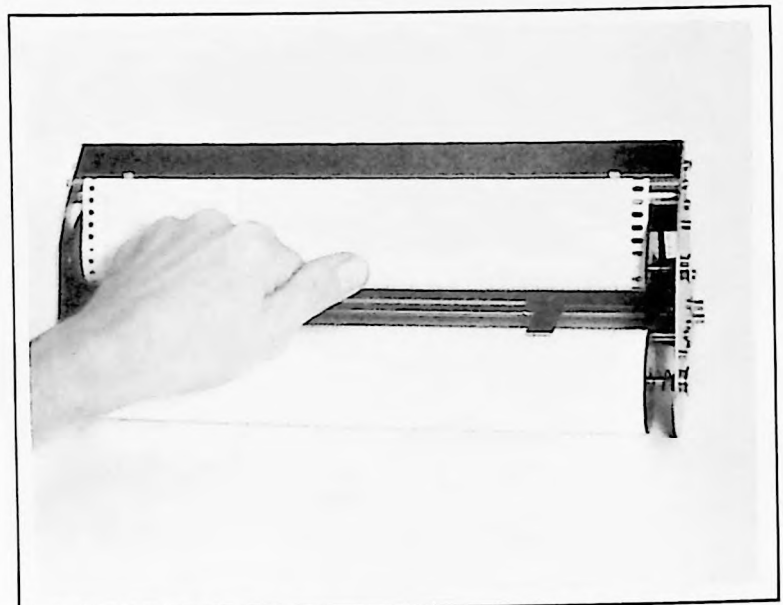


Figure 3-13. Creasing Paper on Take-Up

a. Verify 115/230 line voltage selector switch (on Power Module, see Figure 3-2) matches available power source voltage.

b. Verify correct fuse installed (1.5 ampere for 115V; 0.75 ampere for 230V).

c. Connect the proper power cord to appropriate power source; 115 or 230V  $\pm 10\%$  ac source.

d. Connect input signals.

## SECTION IV

### THEORY OF OPERATION

#### 4-1. GENERAL.

#### 4-2. PURPOSE.

4-3. The theory of operation for the Models 7132A and 7133A is explained in simplified terms. Later paragraphs describe the recorder's circuits in more detail.

#### 4-4. SCOPE.

4-5. The 7132A contains two independent pen drives; the 7133A contains a single pen.

#### 4-6. THEORY.

#### 4-7. SERVO MECHANISM.

4-8. The recorders use self-balancing servo mechanism(s) which drive the pen(s). The pen(s) move at right angles to the direction of chart paper travel, in response to applied input signals. The resulting motion of pen(s) and chart results in a plotted graph of function versus time. The chart is advanced by means of a stepper motor (synchronous with line frequency) acting on the paper drive sprockets.

4-9. The basic servo mechanism operates on the null balance principle (see Figure 4-1). A change in the input voltage ( $e_i$ ) causes an error voltage ( $e_e$ ) to develop. The error voltage is amplified and applied to the servo motor, causing the pen to move, along with the slidewire wiper. The direction of movement is such that the difference between the applied voltage and the feedback voltage decreases until the amplified error voltage is too small to drive the motor. This balancing action is continuous.

#### 4-10. CIRCUIT DESCRIPTION.

#### 4-11. GENERAL.

4-12. The following circuit description (see Figure 4-2) applies to a standard instrument, less options. The synchronous motor advances the paper at one speed. The servo loop itself has a basic sensitivity of 1V full scale. Lower sensitivities are obtained by resistive attenuation before the servo loop. Higher sensitivities are obtained by preamplification before the servo loop.

#### 4-13. ACTIVE FILTER.

4-14. The input signal to the servo loop is applied across a two-stage RC low-pass filter to provide rejection of higher frequency noise outside the bandwidth of the servo loop. The filter is active, employing an amplifier to provide high input impedance in addition to a two-stage RC rolloff characteristic.

#### 4-15. ERROR AMPLIFIERS.

4-16. The first error amplifier utilizes operational type input summing to amplify the algebraic sum of the input currents resulting from the positions of the zero control, feedback potentiometer slider and the input signal. In this manner, the pen zero input position can be set at any point along the scale plus the equivalent of 1.5 full scale from zero.

#### 4-17. POWER AMPLIFIER.

4-18. The second error amplifier operates as a power amplifier with considerable voltage gain. A feedback loop around this amplifier varies the voltage gain available, depending on the magnitude of the voltage applied to the dc servo motor. Within the deadband voltage limits of the servo motor, the voltage gain is maximum, thus effectively minimizing the deadband of the entire loop.

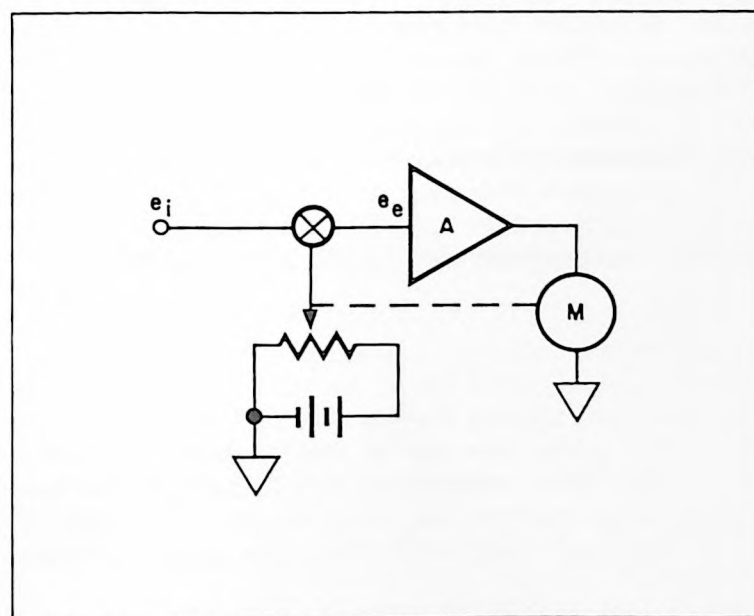


Figure 4-1. Typical Null Balance Recorder

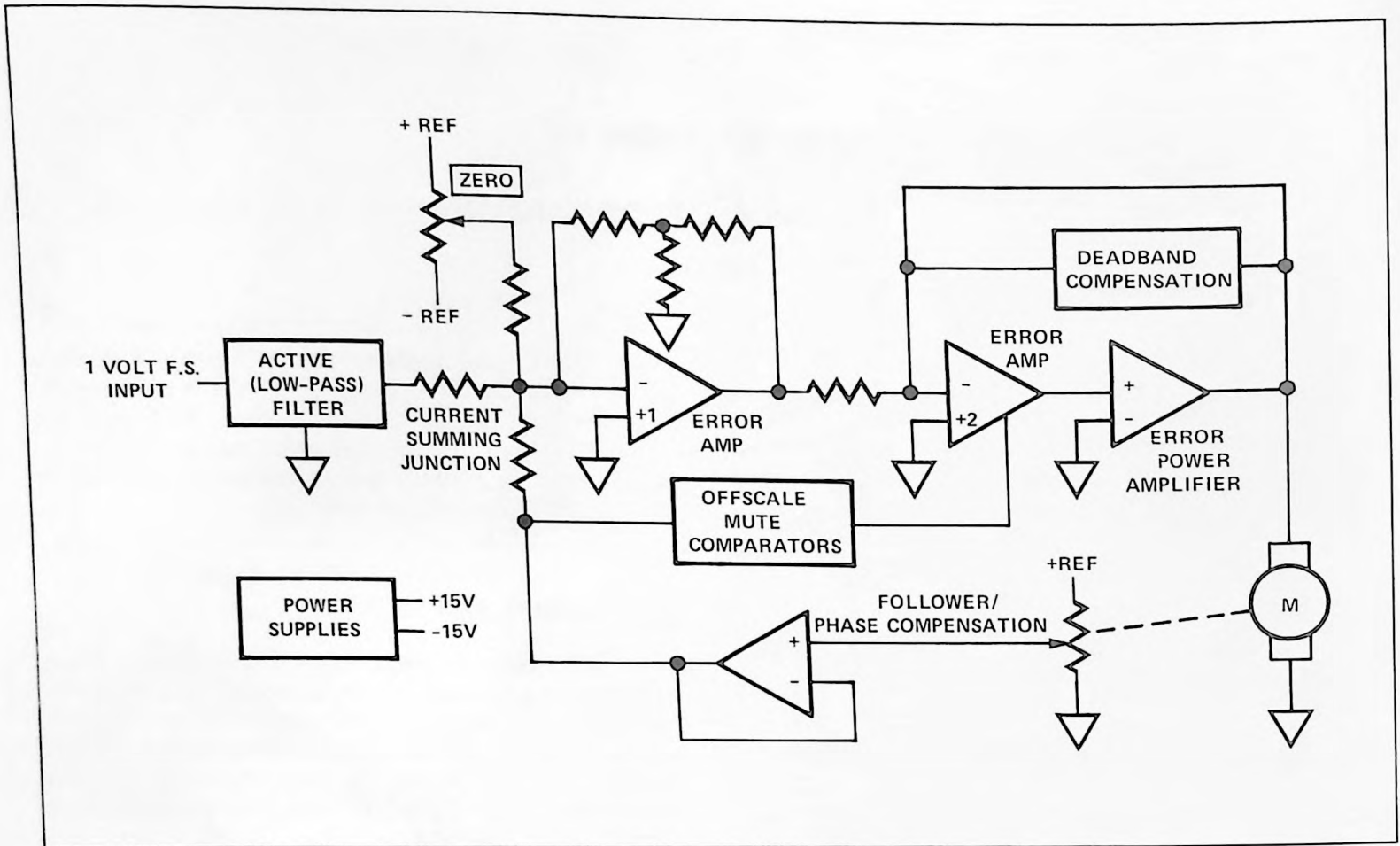


Figure 4-2. Servo Control Loop

## 4-19. SLIDEWIRE VOLTAGE FOLLOWER.

4-20. A voltage proportional to pen position is isolated from the low impedance input summing network by a unity-gain amplifier. This amplifier also incorporates a lead-lag compensation circuit to optimize overshoot and stability characteristics.

## 4-21. OFFSCALE MUTING.

4-22. When the main pen(s) travels beyond a predetermined point in the margins of the paper, voltage comparators clamp the output of error amplifier two to circuit common. This removes drive to the servo motor in a unidirectional manner. When input signals indicate a pen movement back onto the active area on the chart grid, the proper voltage polarity is still available to bring the pen back onscale. Thus, even though there

is no power dissipated in the motor when pen is offscale, the pen still has the ability to respond immediately to an onscale voltage present at the servo loop input.

## 4-23. POWER SUPPLIES.

4-24. Two series-pass regulator type power supplies provide +15V and -15V to the various amplifier stages. Each supply employs short-circuit current limiting which will allow short-circuiting of the supply without damage to the components. Two supplies of +12V and -12V supply the servo motor power amplifier potentials. In addition, a 5V power supply is used to control the Eight-Speed Stepper Motor; a 30V power supply furnishes control for the Remote Chart On-Off, Remote Pen Lift, and Event Marker (Option 037/537). Proper functioning of the 5V power supply is dependent on the 30V power supply.



## SECTION V

### MAINTENANCE, PERFORMANCE CHECKS, AND ADJUSTMENTS

#### 5-1. INSPECTION REQUIREMENTS.

#### 5-2. INTRODUCTION.

5-3. This section provides information for maintenance, testing, functional checks, and adjustments of the Models 7132A and 7133A Strip Chart Recorders. Maintenance procedures, performance tests, and adjustments will ensure that the instrument conforms to specifications. Functional checks verify the instrument to be in an operational condition. If the instrument fails to meet specifications, or is inoperable, refer to Section VII, Troubleshooting.

#### 5-4. PREVENTIVE MAINTENANCE.

#### 5-5. GENERAL.

5-6. The recorder must be maintained properly to obtain accurate, trouble-free operation. This requires periodic cleaning, performance checks, and visual and electrical checks. In accordance with good maintenance procedures for all precision measuring instruments, Hewlett-Packard recorders should be protected from dust. Cover the instrument when not in use.

#### WARNING

Some of the maintenance and servicing operations described herein are performed with protective covers removed. Be careful when performing these operations. Line voltage is always present on terminals including the power input connector, fuse holder, power switch, etc. There are voltages present elsewhere in the recorder that could be lethal, depending upon humidity conditions and intrinsic resistance of body tissues. Therefore, it is good practice to avoid personal contact with interior circuits.

#### WARNING

For continued protection against fire hazard, replace fuse with same type and rating only.

#### 5-7. ENVIRONMENTAL OPERATION.

5-8. The instrument is designed to operate over an ambient temperature range of 0°C to 55°C. Operation outside this temperature range will produce inaccurate results and may cause damage to the recorder. In areas with high humidity, graph paper may become distorted, affecting the accuracy of the grid lines. The area of operation should have a minimum of air contamination (dirt, dust, pollutants). Excessive air contamination will result in a need for more frequent cleaning.

#### 5-9. CLEANING.

5-10. Thorough cleaning should be performed periodically. Intervals are determined by type of operation, local air contamination, and climatic conditions. Under normal use and conditions, cleaning intervals for cleaning slider rod/block should be every six months or 500 hours, whichever occurs first. Frequency of cleaning slidewire assembly (balance potentiometer) should be every three months or 250 hours of operation, whichever occurs first. Cleaning procedures are as follows:

- a. Remove power cord.
- b. Remove chart magazine and top cover. See paragraph 5-17.
- c. Blow out inaccessible dust accumulation with an air gun.
- d. Slider rod (Figure 5-1) should be kept free of any oils or dust because slider block has Teflon impregnated bushings that should be kept free from any lubricant. Spray slider block and slider rod with slidewire cleaner, HP Part Number 5080-3605 from Accessory Kit. Move servo pen through several full-scale excursions, and wipe clean with a Kimwipe.
- e. Use slidewire cleaner (HP Part Number 5080-3605) to periodically clean the plastic-coated slidewire.

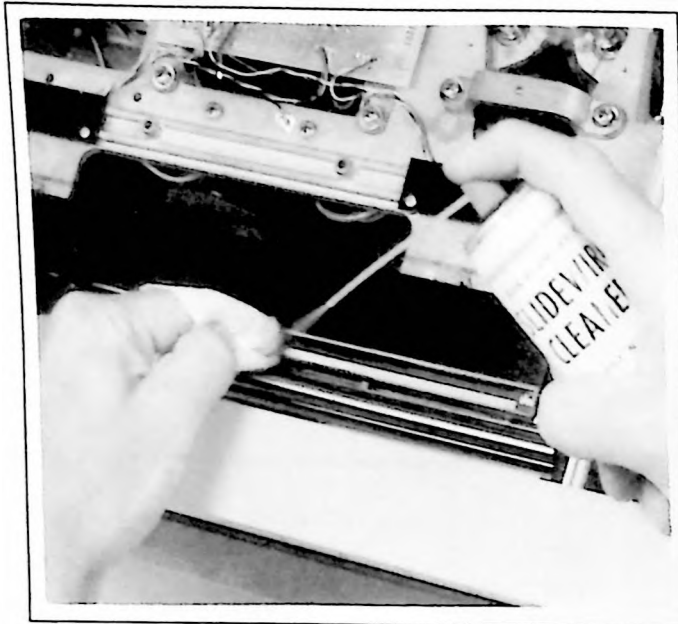


Figure 5-1. Slider Rod Cleaning

and gold return strip on the slidewire assembly (Figure 5-2). Thoroughly saturate a Kimwipe or cotton swab with cleaner and rub slidewire assembly along entire length, using tissue or swab. Move servo pen through several excursions to assure wipers are clean.

#### NOTE

If there is discoloration on tissue or swab, repeat cleaning process until there is no stain. Then, clean once more to ensure all contaminants are removed.

f. After cleaning, lubricate sparingly with Slidewire Lubricant, HP Part Number 5080-3635, furnished with Accessory Kit. See Figure 5-3. This will reduce wear and chemical contamination. Wipe off all excess lubricant on Slidewire Assembly.

g. Move pen through full excursion several times.

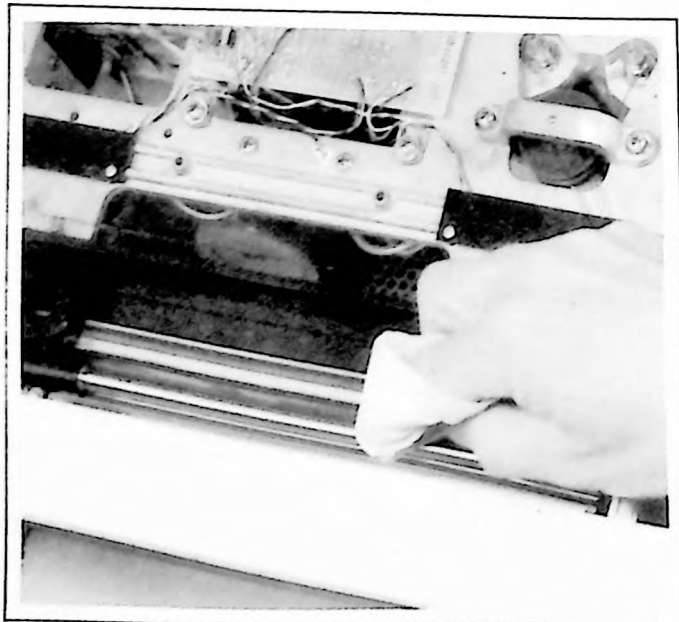


Figure 5-2. Slidewire Assembly Cleaning

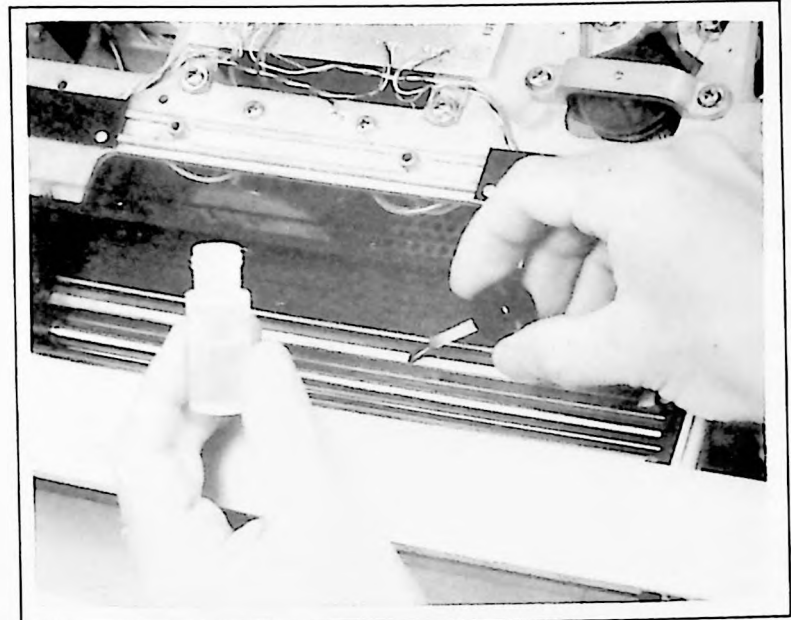


Figure 5-3. Slidewire Assembly Lubrication

h. Perform identical procedure for lower channel on 7132A.

#### CAUTION

To clean lower slidewire on Model 7132A, slide the servo module half way out for access. If Event Marker is installed, and servo module removed, the instrument must be supported in a horizontal position to avoid clogging Event Marker primer line with ink. Remove cover plate on underside of servo module (two screws). The lower slidewire is visible and accessible for cleaning.

#### 5-11. LUBRICATION.

5-12. All bearings, bushings, tracks, servo motors, etc., are prelubricated by the manufacturer and require no further lubrication.

#### CAUTION

Do not use Freon, Trichlorethylene, or other popular cleaning solvents to remove old grease or dust. The solvent could penetrate vital parts and shorten their life.

#### 5-13. VISUAL INSPECTION.

5-14. During periodic maintenance, perform a visual inspection. The following is general and should not be restricted to those items mentioned:

- a. Ensure servo motors are mounted securely.
- b. Check mounting screws and square pin connectors on circuit boards for proper connections.

c. Move pen carriages back and forth listening for scrapes, grinding, noises, or other indications of faulty performance, while feeling for any binding during travel.

d. Check for loose connections, cracked circuit boards, and other defects.

e. If unit is equipped with event marker, check ink system connections for air or ink leaks. Remove ink from any circuitry. Ink can become conductive and can affect calibration or common mode rejection. If ink is found on the circuitry, clean with soap and water. Rinse and dry thoroughly.

## 5-15. MECHANICAL MAINTENANCE.

## 5-16. DISASSEMBLY/ASSEMBLY.

### WARNING

Grounding is affected by the screws in the front panel. An external ground wire must be used to ground the preamplifier front panel when using an extender board. Do not apply input greater than 24V unless preamplifier is plugged in normally, with mounting screws installed.

5-17. Access to components for maintenance and adjustment is accomplished in the following manner:

a. Chart Magazine — Press magazine latch down to release magazine. Lift magazine up and out. Refer to Figure 5-4.

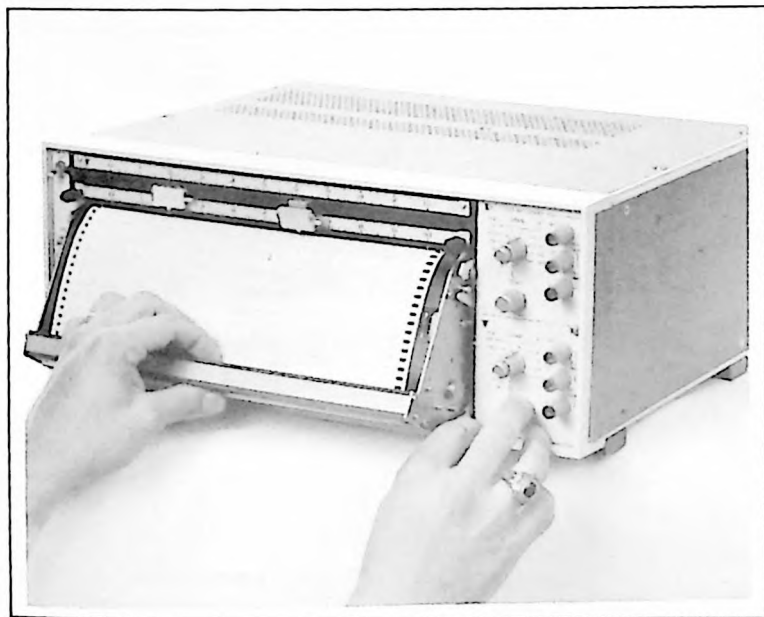


Figure 5-4. Chart Magazine Removal

b. Top Cover — Cover retained by five screws. Remove screws. See Figure 5-5.

c. Side Covers — To remove the side covers (left and right sides) remove screws (four on each side). See Figure 5-5.

d. Back Cover — A total of six screws must be removed. It is not necessary to remove side or top covers. See Figure 5-6.

### CAUTION

Use care when removing servo module. Remove disposable pens to prevent damage to pen nib. If event markers are installed, module should be supported in horizontal position to avoid ink spillage.

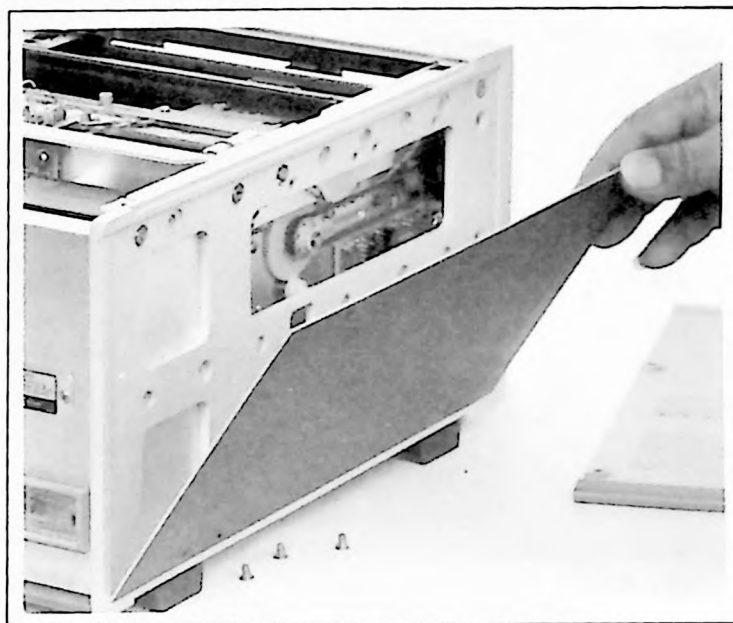


Figure 5-5. Top/Side Cover Removal

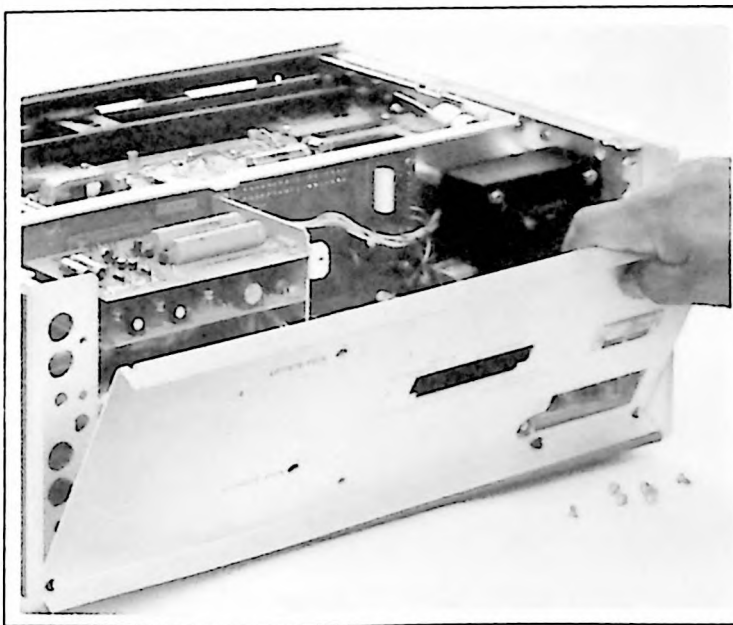


Figure 5-6. Back Cover Removal



e. Servo Module — To gain access to pens, servo motors, etc., unscrew two screws from plate at rear of chart magazine cavity. Servo module slides out on tracks (Figure 5-7).

### WARNING

Grounding is affected by the screws in the front panel. An external ground wire must be used to ground the preamplifier front panel when using an extender board. Do not apply input greater than 24V unless preamplifier is plugged in normally, with mounting screws installed.

f. Front Panel — Two screws on left inside and one screw on center of front panel are removed. Ease panel out together with any attached preamplifier circuit boards. See Figure 5-8.

#### 5-18. PEN MAINTENANCE.

5-19. Event Marker (Option 037/537) pen writing failure may be caused by dried ink sediment, long disuse, or oil on the pen tip or paper. Dried ink forms brittle crust particles that can build up in the supply line and stop ink flow. The event marker pen should align front-to-back with the pen. On the Model 7132A, the right event marker pen should align front-to-back with the upper channel pen; left event marker with lower channel pen. Pen tip(s) should agree front-to-back with  $\pm 0.010$  inch with the main pen(s). The pen force in the event marker pen down position should be 8 ( $\pm 2$ ) grams. The disposable pens, standard on Models 7132A and 7133A, under normal conditions, will write for a minimum of 1000 feet before running out

of ink. To change the disposable pen, perform the following steps:

- Move the pen lift to the UP position. See Figure 3-1 for location of pen lift.
- Remove used pen by grasping by right-hand projection and lifting up and out.
- Take a disposable pen from pack of three provided and grasp pen by projection.
- Remove pen tip protector from disposable pen.
- Install disposable pen in pen holder with pen tip pointing downwards and grasping projection to right (see Figure 5-9).
- Move pen lift to the DOWN position.

#### 5-20. SLIDEWIRE MAINTENANCE.

5-21. CLEANING. For best performance, a regular slidewire cleaning program should be maintained. Contamination of the unit can result from failure to do so, causing irregular or jumpy trace as the pen passes the contaminated area. See paragraphs 5-6 and 5-9 for cleaning methods.

5-22. WIPERS. Under normal conditions, the wipers do not require replacement or adjustment. However, a quick check should be made when adequate smoothness of writing cannot be obtained, or when slidewire requires frequent cleaning. Wiper replacement is performed in the following manner:

- Slide out servo module. See paragraph 5-17.
- Note location of extrusion bar ends with respect to servo module casting. Extrusion bar must be placed

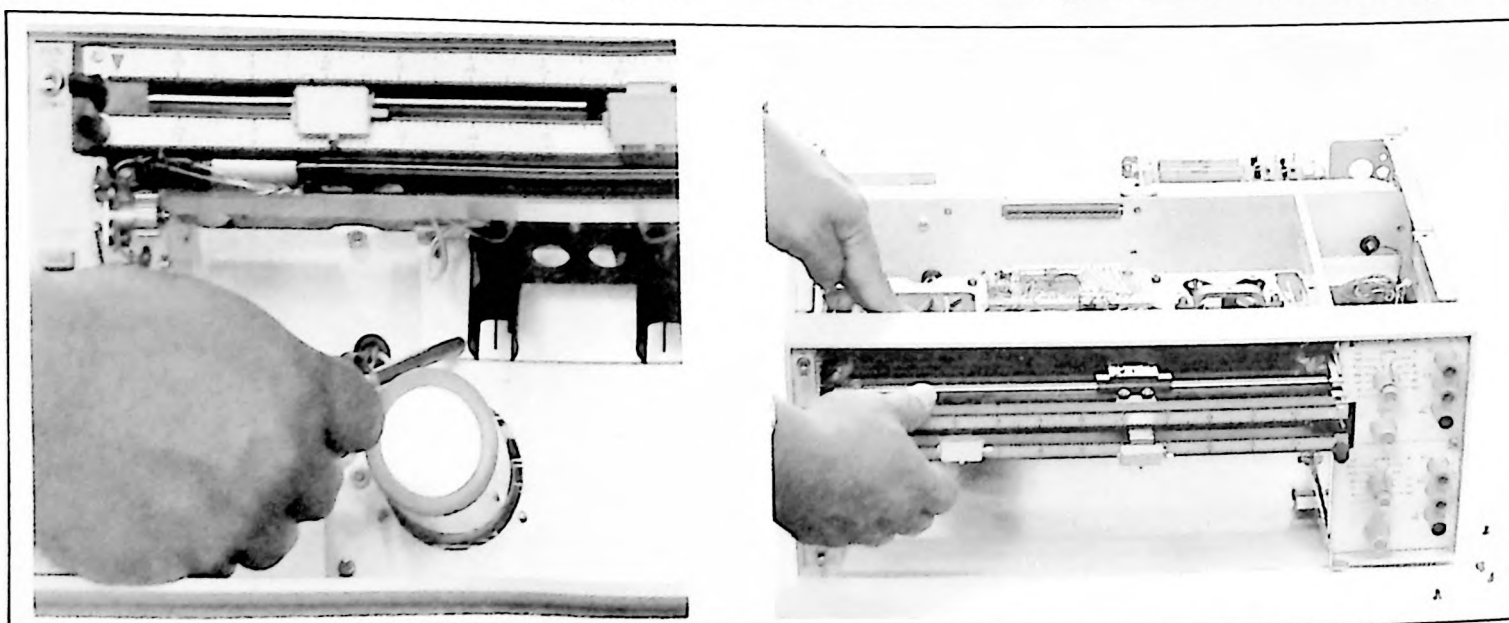


Figure 5-7. Servo Module Removal



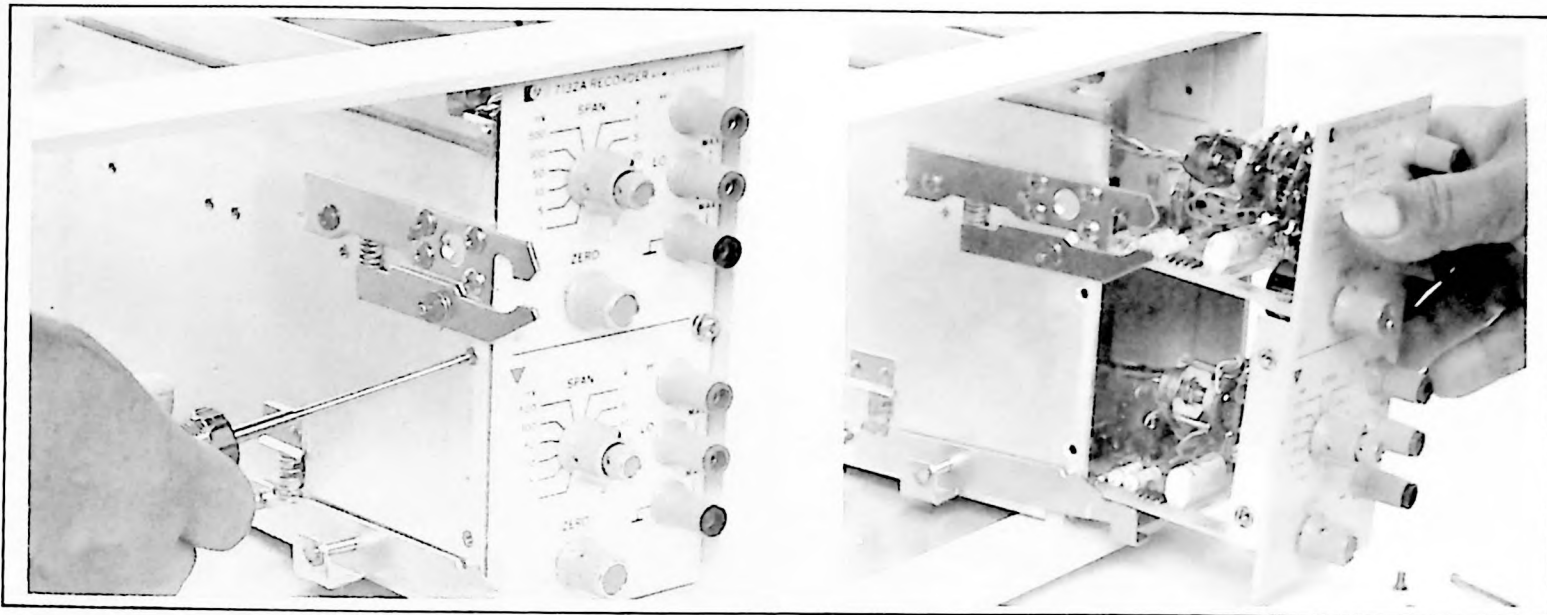


Figure 5-8. Front Panel Removal

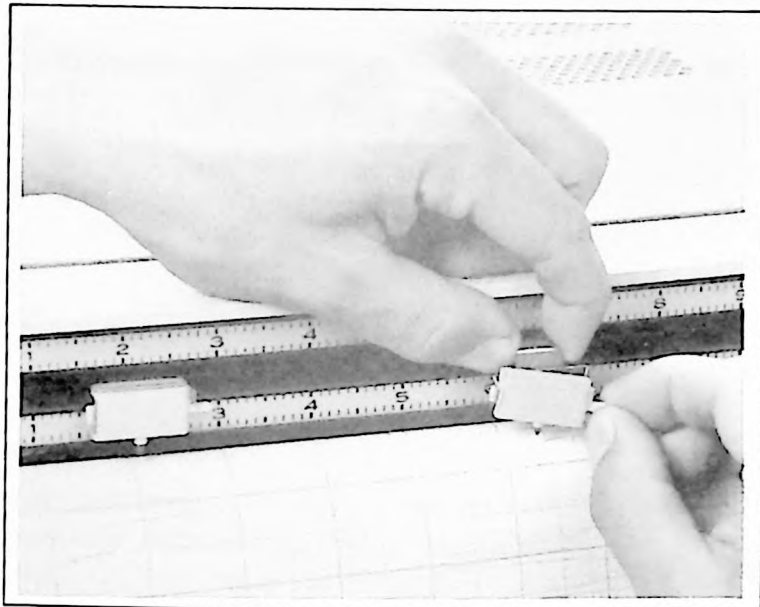


Figure 5-9. Disposable Pen Installation

in same location to ensure wipers do not lose contact with slidewires.

c. Unscrew two screws holding extrusion bar. See Figure 5-10. Slide extrusion bar back to gain access to slider block.

d. Rotate slider block upwards carefully. Unscrew wiper. See Figure 5-10.

e. Install new wiper by reversing this procedure.

#### CAUTION

Be careful when assembling; the slidewire adjacent to the gold slidewire return strip can be easily damaged. Ensure the extrusion bar is aligned, the slider block is correctly fitted to the extrusion bar, and the tubing is placed

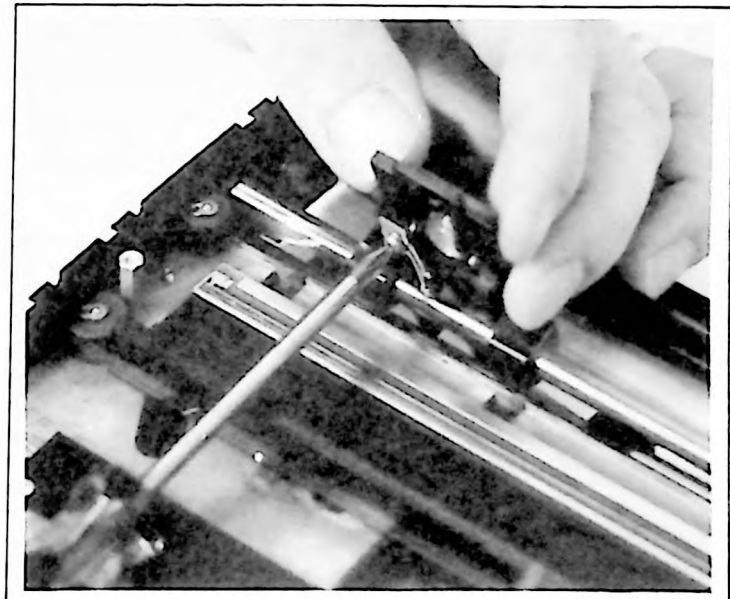


Figure 5-10. Wiper Removal

properly in the tube guide. Additionally, when wipers or slidewire is installed, ensure extrusion bar is properly installed so that the wiper does not lose contact with the slidewire.

### 5-23. SERVO MOTOR MAINTENANCE.

5-24. The servo motors are basically free from maintenance. The high thermal mass aluminum frames and all-ball-bearing construction provide long life. Do not disassemble a servo motor. The servo motors are magnetized after assembly and if disassembled, the magnet becomes partly demagnetized. If it becomes necessary, however, to replace a servo motor, perform the procedure indicated in the following steps:

- Remove servo module. See paragraph 5-17.
- Remove motor shield (two nuts and washer; screws are not removed). See Figure 5-11.

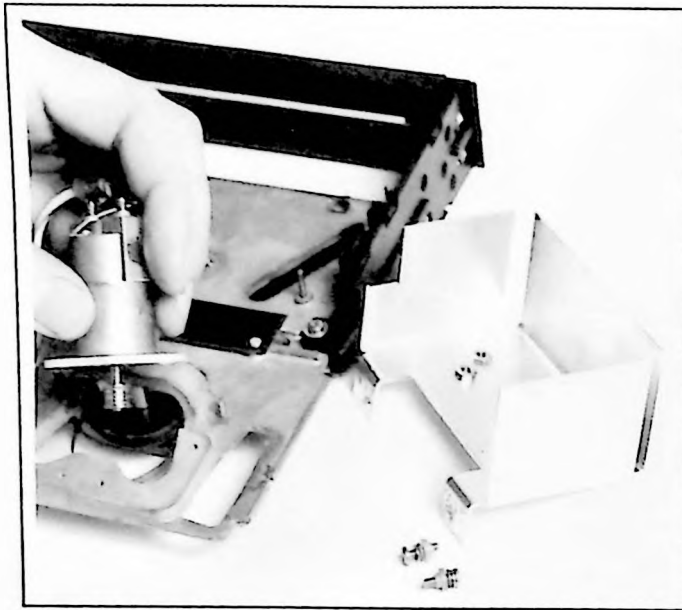


Figure 5-11. Servo Motor Removal

- c. Unsolder two wires from feedthrough capacitors on the motor. Remove third lead (ground) by removing screw.

**CAUTION**

Use care not to break off feedthrough capacitors when unsoldering leads as this will result in irreparable damage to the motor.

- d. Remove screws, nuts, and washers holding servo motor mounting plate to chassis. Drive belt drops off motor pulley. See Figure 5-11.
- e. Replace with new unit (Part Number 5060-6659) (on 7132A, lower unit, Part Number 5060-6660), reversing removal procedure.
- f. Perform Drive Belt Tension Adjustment, paragraph 5-55.

#### 5-25. DRIVE BELT REPLACEMENT.

5-26. To replace the drive belt (servo motor to drive pulley):

- Remove servo module. See paragraph 5-17.
- Remove motor shield. See Figure 5-11.
- Use awl to spring ratchet leaves in slider block to loosen tension on driven belt. See Figure 5-12.
- Loosen two screws holding servo motor mounting clamp to motor.
- Remove chassis cap (two screws), Part Number 07130-22410.

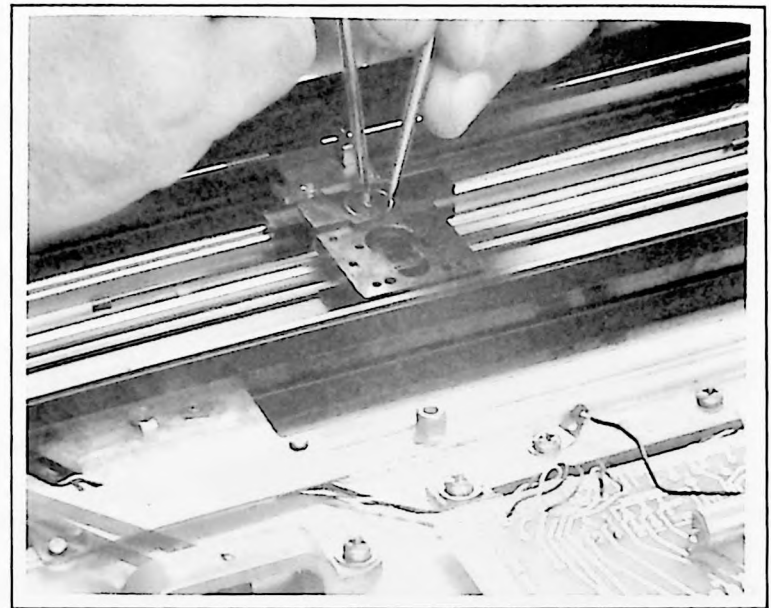


Figure 5-12. Driven Belt-Loosening Tension

- f. Slide off old belt. Replace with new belt, Part Number 1500-0343. Reverse removal procedure to replace new belt.

**CAUTION**

Note position of washers on pulley when removing belt. Ensure correct order when replacing with new belt. Damage to new belt could occur if washers assembled in incorrect order. See Figure 5-13.

- Perform Drive Belt Tension Adjustment and Driven Belt Tension Adjustment, paragraphs 5-55 and 5-57.
- Procedure for other drive belt on 7132A is identical. Belt located on underside of servo module.

**NOTE**

If lower channel drive belt on 7132A is to be replaced, remove slidewire baffle on lower channel.

#### 5-27. DRIVEN BELT REMOVAL/REPLACEMENT.

5-28. To remove the driven belt:

- Remove servo module. See paragraph 5-17.
- Use awl to advance belt tension wheel, then spring ratchet leaves in slider block to loosen tension on driven belt. See Figure 5-12.
- Remove old belt.

5-29. To replace:

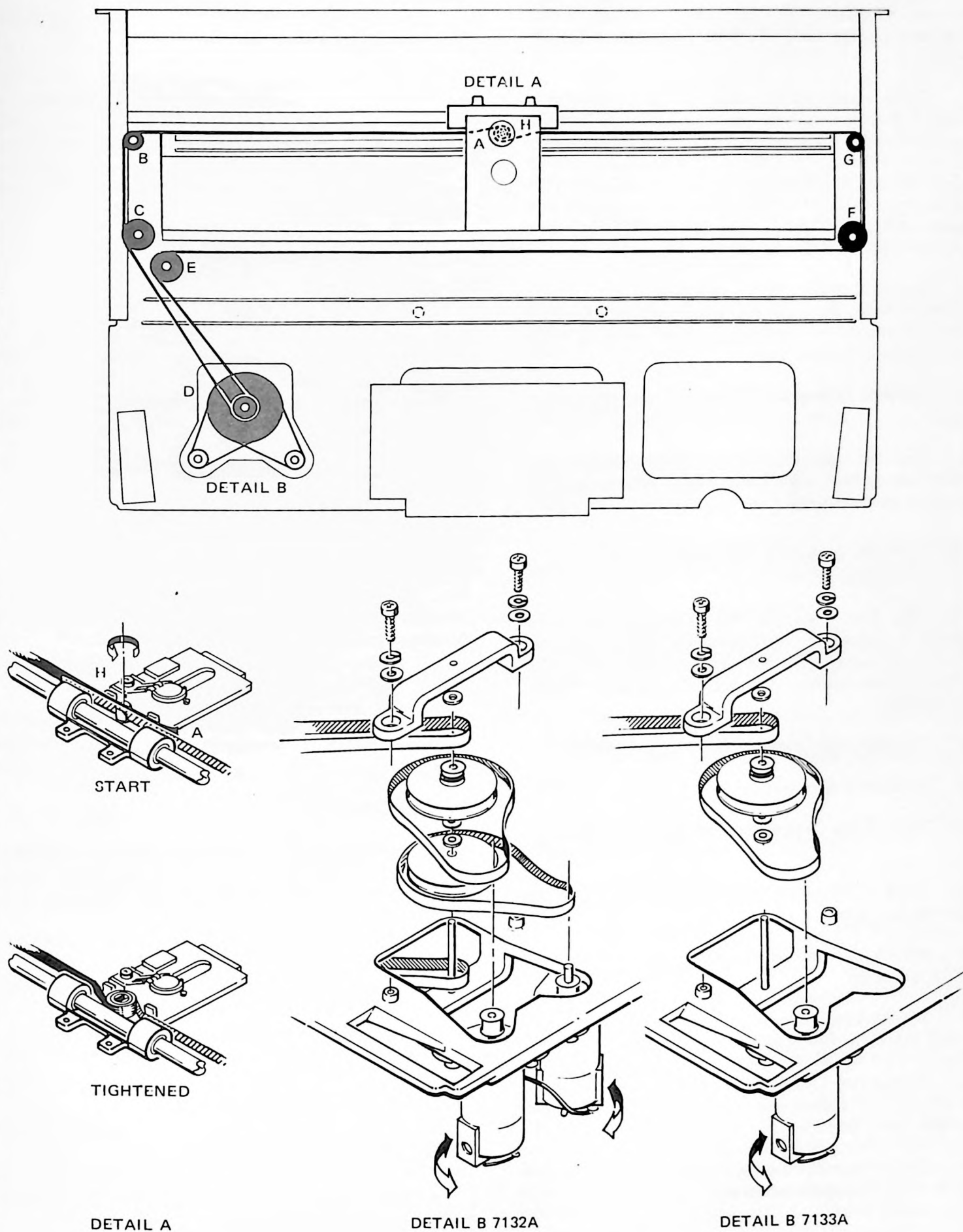


Figure 5-13. Driven Belt Replacement



a. Use new belt, Part Number 1500-0348 and slide one end (A) underneath slider block until end barely protrudes at other end of slider block. (See Figure 5-13.)

b. Loop around small pulley (B) at right side of recorder. Position belt around next pulley (C) up to large pulley (D). From large pulley, loop around small pulley (E) adjacent to pulley (C). Then loop around pulley (E) over to pulley in left side of recorder (G) and finally into slider block (H) where it crosses and passes other end of belt. This end should also barely protrude at end of slider block, see Figure 5-13.

c. Replace ratchet. Both ends of belt are grasped by ratchet. Slack must exist in belt. (Reason both ends of belt should barely protrude at each end of slider block.) Tighten ratchet down.

d. Perform Driven Belt Tension Adjustment, paragraph 5-57.

e. Procedure for removal and replacement of other driven belt on 7132A is identical. Belt is located on underside of servo module.

#### 5-30. EVENT MARKER MAINTENANCE (OPTION 037/537).

5-31. The Event Marker Pen Assembly should be flushed at regular 90-day intervals, before extended storage, or as required. Perform the following procedures for pen writing failure or for periodic 90-day maintenance:

- a. Remove chart magazine. See paragraph 5-17.
- b. Remove ink cartridge.
- c. Fill syringe (supplied with instrument) with water.
- d. Place a container such as a paper cup, under the event marker pen.
- e. Attach the end of the syringe tube to the ink cartridge piercer.
- f. Slowly squeeze syringe to flush ink from event marker pen lines with water.
- g. Repeat step f. until plastic tubes of event marker are cleaned of excess ink indicated by clear water emerging from line.
- h. Use syringe to clear line of excess water by forcing air through plastic tubes until no water remains in event marker lines.
- i. Re-prime, and re-insert ink cartridge.
- j. Replace chart magazine.

#### 5-32. ELECTRICAL REQUIREMENTS.

#### 5-33. REQUIREMENTS.

5-34. The model requires minimum electrical maintenance. It has been carefully calibrated during manufacture. It is strongly recommended that an authorized service technician perform repairs and recalibrations. However, if calibration adjustments are necessary, certain adjustment procedures will be detailed in later paragraphs of this section.

#### 5-35. PERFORMANCE TESTS.

#### 5-36. CRITERIA.

5-37. Performance checks are in-cabinet tests designed to compare the instrument's performance with its specifications (see Table 1-1). If a performance test on the instrument does not meet specifications, refer to the appropriate troubleshooting procedures for corrective action. Table 5-1 lists the test equipment needed to make the checks. The checks may be used for the following purposes:

- a. As part of an incoming inspection check of instrument specifications.
- b. Periodically for instruments used in systems as part of a preventive maintenance program to provide maximum reliability.
- c. To aid in diagnosing malfunctions.
- d. To verify performance after any repairs or adjustments before returning the instrument to routine operation.

#### 5-38. INITIAL SETUP.

5-39. Place the model in the following configuration:

Table 5-1. Recommended Test Equipment

- |    |  |
|----|--|
| 1. | HP Model 34740A Digital Voltmeter Display with HP Model 34703A DCN/DCA Ohmmeter. |
| 2. | GR 1455 Decade Voltage Divider.  |
| 3. | Bausch & Lomb Measuring Magnifier. No. 81-34-35.                                 |
| 4. | HP Model 3310A Function Generator.   |
| 5. | HP Model 740B DC Voltage Standard.   |
| 6. | HP Model 970A Probe Multimeter.  |
| 7. | HP Model 1707B Dual Channel Oscilloscope.  |
| 8. | General Radio Model 1862C Megohmmeter.   |
| 9. | HP Model 4437A Attenuator.   |



a. Install appropriate disposable pen. Check color. See paragraph 3-16.

b. Install chart paper into magazine. Install magazine into instrument. Check magazine at all tilt angles. See paragraph 3-17.

c. 115/230 slide switch to line voltage.

d. LINE switch ON.

e. ZERO control centered.

f. PEN(S) in UP position.

#### 5-40. CHART DRIVE CHECK.

5-41. To check performance:

a. Position CHART switch/pushbutton to slowest speed.

b. PEN(S) in DOWN position.

c. Allow chart to run out at least 0.25 inch. Then time chart for at least 1 inch of travel.

d. Speed must correspond to that marked on the instrument.

#### NOTE

During test, check for correct tracking of paper. Sprockets should not tear holes and paper should not bubble off platen.

#### 5-42. PEN WRITING/CLEARANCE CHECK.

5-43. To test:

a. Position pens with ZERO controls and check for smooth operation (no skipping). (Clockwise rotation of ZERO control moves pen to right.)

b. Check pens for full scale operation.

#### 5-44. ACCURACY (LINEARITY AND DEADBAND).

5-45. To determine accuracy, perform the following steps:

a. Set DC Standard to zero volts and connect output to a voltage divider.

b. Connect output of voltage divider to input of recorder.

#### NOTE

Perform procedure on one channel only of 7132A.

c. Turn on recorder.

d. Position pen(s) to zero position. Lower pen(s).

e. Set recorder RANGE switch to IV.

f. Set DC Standard to 1V. Verify pen drives to full scale.

#### NOTE

Through rear panel, adjust CAL A2R4 on Servo Amplifier Board for exact full scale travel of pens.

g. With adjustment performed, remove voltage from the voltage divider input and recheck zero position.

h. Pen line should be centered to within  $\pm 0.005$  inch of grid lines at zero and full scale.

i. Using GR1455 Decade Voltage Divider, step dc voltage in 10% increments, sequencing from 100% to 10% of full scale and back to 100%. (Total 18 steps.)

j. Traces should agree with chart grid lines at each step to within  $\pm 0.020$  inch.

k. Repeat for second channel.

5-46. To determine deadband, perform the following steps:

a. Connect function generator, attenuator, 600 ohm resistor, and recorder as shown in Figure 5-14. A 600 ohm current termination is required with the attenuator.

b. Turn instrument on. Select any convenient range scale on recorder.

c. Set attenuator dB setting to 0 dB.

d. Position function generator to 0.5 Hz sine wave.

e. Adjust amplitude on function generator for a full scale p-p indication on the recorder.

f. Position attenuator to 70 dB and observe for pen movement on recorder. (Pen should have drawn a straight line.)

g. Decrease attenuator in 1 dB steps and note the setting at which regular pen movement first occurs. The attenuator setting should be greater than or equal to 60 dB equating to less than or equal to 0.1% of full scale for deadband limit.

h. Use a Bausch and Lomb measuring magnifier Number 81-34-35 to aid with measurement verification.

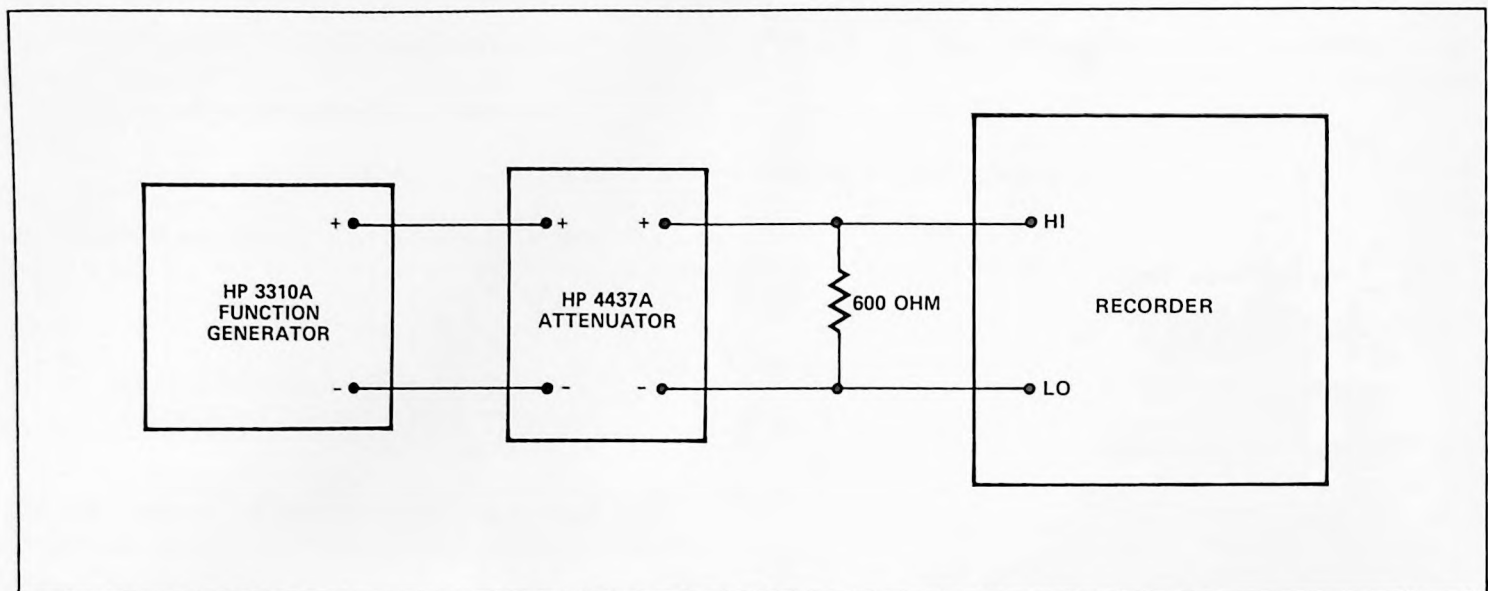


Figure 5-14. Connections for Deadband Test

## 5-47. COMMON MODE REJECTION.

## 5-48. DC Common Mode Rejection.

a. Set up recorder and connect 200V dc source as shown in Figure 5-15. A resistive unbalance in high lead of less than or equal to 1k is present.

b. Switch recorder on and set attenuator range switch to 1 mV.

c. Set voltage source to zero volt and mark servo pen position.

d. Apply 200V dc.

e. Verify servo pen does not exceed 2 inches displacement from the reference position (120 dB on 1 mV range).

## 5-49. AC Common Mode Rejection.

a. Connect function generator to recorder with 1k ohm resistor across input terminals as shown in Figure 5-16.

b. Switch recorder on.

c. Select range switch to 1 mV.

d. Set voltage source to zero volt and mark servo pen position as a reference point.

e. Set function generator to 10V p-p 60 Hz.

f. Servo pen movement should not exceed 1 inch from the reference point when AC CMR is 100 dB or greater.

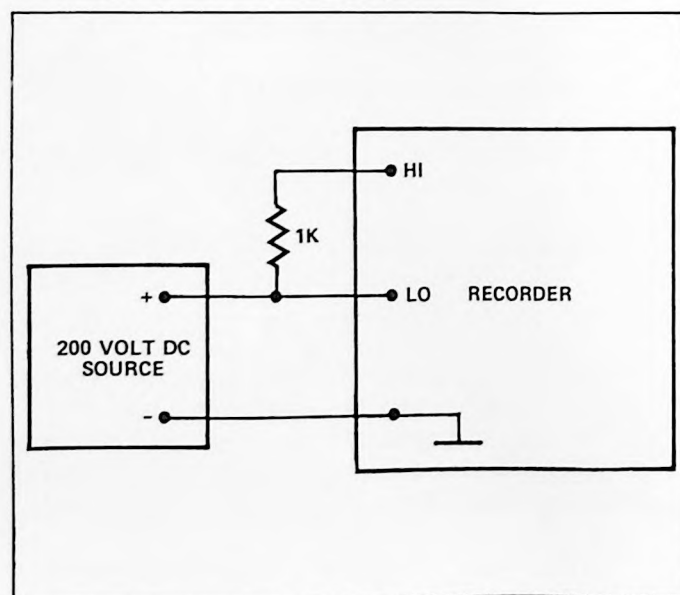


Figure 5-15. Connections for DC CMR Test

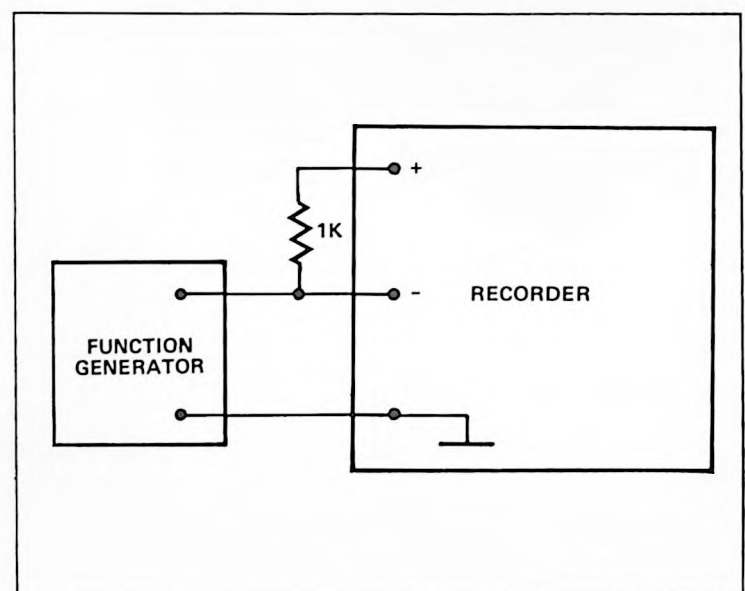


Figure 5-16. Connections for AC CMR Test

**5-50. MECHANICAL ADJUSTMENTS.****5-51. PROCEDURE.**

5-52. Any adjustment to the instrument is deemed necessary only when it is determined the instrument is out of adjustment per specification requirements, but not malfunctioning due to circuit failure.

**5-53. BRACKET EARS ADJUSTMENT.**

5-54. If pen tip(s) do not clear the paper when in the raised position, or contact paper in lower position, the bracket ears on both sides of the magazine cavity may need adjustment. The procedure is:

- a. Remove chart magazine. See paragraph 5-17.
- b. Loosen four screws at front of bracket and barely loosen fifth screw on rear of bracket. See Figure 5-17.
- c. Insert screwdriver in provided slot at rear of bracket and rotate screwdriver to lower or raise magazine bracket.
- d. Tighten all screws.
- e. Make identical adjustment on other bracket ear, if necessary.
- f. Operate recorder. Check pen(s) for clearance or skipping.

**5-55. DRIVE BELT TENSION ADJUSTMENT.**

5-56. After replacing the servo motor or drive belt, it is necessary to make a belt tension adjustment. A gram gauge and ruler are necessary. To adjust:



Figure 5-17. Bracket Ears Adjustment

a. Loosen screws (2) holding servo motor mounting clamp to motor.

b. Repeated adjustment (moving motor back and forth) may be necessary to ensure correct belt tension (belt deflection of 0.040 inch at 40 grams  $\pm$  5 grams). See Figure 5-18.

**NOTE**

The point of deflection should be half way between points A and B (points of tangency). See Figure 5-18.

c. Lower channel drive belt tension adjustment on 7132A is similar.

**5-57. DRIVEN BELT TENSION ADJUSTMENT.**

5-58. When replacing the driven belt it is necessary to make an adjustment on the new belt for correct tension. Gram gauge is needed. The procedure is as follows:

- a. Remove two screws holding tube guide. Move tube guide back.
- b. Place gram gauge on belt at center of slidewire mount. Tension should measure 34 grams. (Deflected belt will touch back of slidewire mount at 34 grams.) See Figure 5-19.
- c. Rotate ratchet on slider block (Figure 5-12) to tighten belt to proper tension.
- d. Procedure for lower channel driven belt tension adjustment on 7132A is identical.

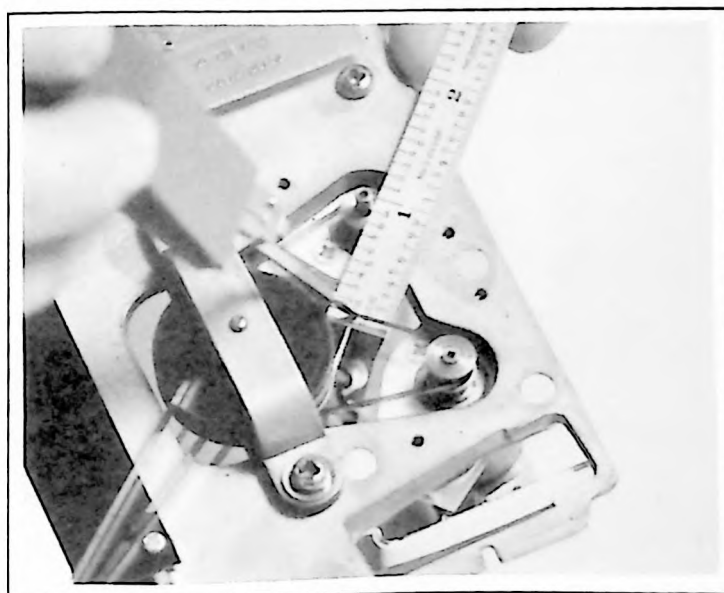


Figure 5-18. Drive Belt Tension Adjustment



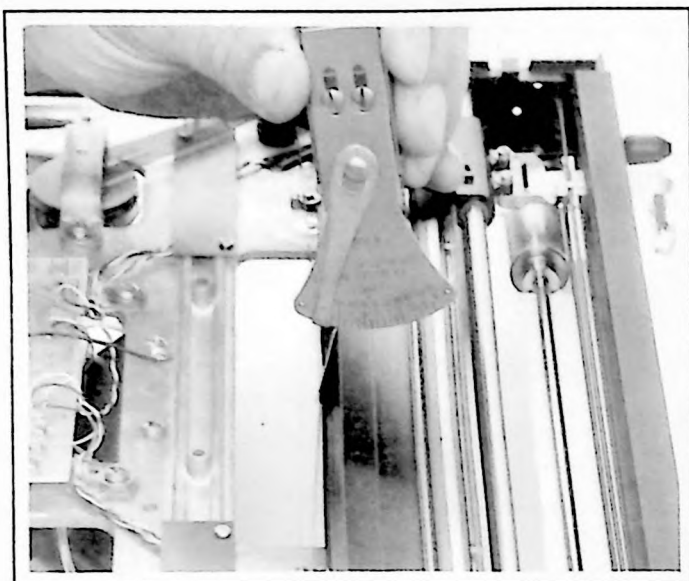


Figure 5-19. Driven Belt Tension Adjustment

**5-59. ELECTRICAL ADJUSTMENTS.****5-60. OFFSCALE LIMIT ADJUSTMENTS.**

5-61. To adjust the right-hand and left-hand limits at right and left margins:

- a. Remove rear cover. See paragraph 5-17.
- b. Install spacers (0.020 in.) at right and left ends of slider rod.
- c. Position pens offscale to right, using zero ADJ.
- d. With right-hand limit (A2R16) set fully counterclockwise, adjust right-hand limit potentiometer to point at which servo motor rotation just ceases operation (Figure 5-20). (It may be necessary to hold slider manually against spacer in order to prevent oscillation against spacer/number combination.)

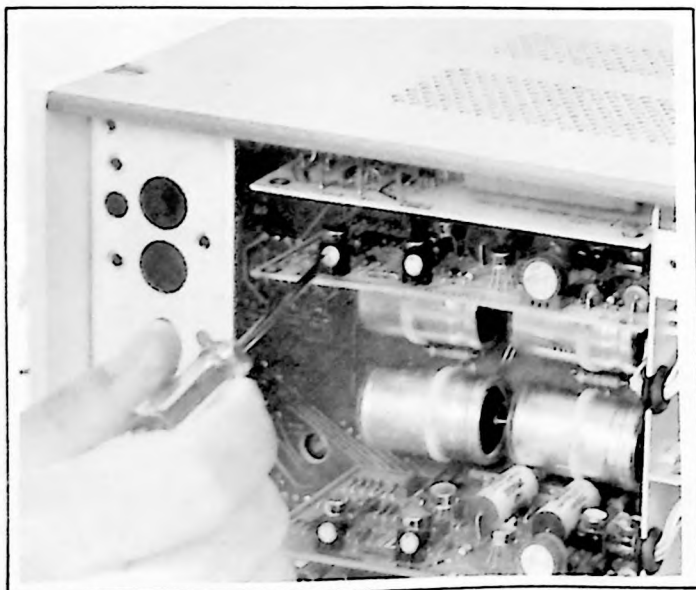


Figure 5-20. Offscale Limit Adjustments

- e. Repeat procedure for lower channel on 7132A.
- f. Position pens off scale to left.
- g. With left-hand limit (A2R19) set fully counterclockwise, adjust left-hand limit potentiometer to point at which servo motor rotation just ceases operation. (It may be necessary to hold slider manually against spacer in order to prevent oscillation against spacer/number combination.)
- h. Repeat procedure for lower channel on 7132A.
- i. Remove spacers. Recheck offscale limits at left and right margins. Pen traces at offscale limit points should not have changed more than  $\pm 0.005$  inch.

**5-62. FULL SCALE CALIBRATION.**

5-63. Calibration on the 1 mV range is preferred since it generally gives a smaller maximum range-to-range error. If needed, perform calibration adjustment as follows: For 1V and below, use a 1V DC Standard with a Decade Voltage Divider. Above 1V full scale, use appropriate DC Standard.

- a. Connect DC Standard through the Decade Voltage Divider to input terminals.

**NOTE**

Perform procedure on one channel only.

- b. Position pen(s) to zero.
- c. Apply positive signal equal to full scale range.
- d. Adjust CAL potentiometer(s) (A2R4) through rear of recorder until pen(s) coincide with full scale line (Figure 5-21).
- e. Recheck for zero and full scale positions. Zero and full scale should agree with grid line to within  $\pm 0.005$  inch.

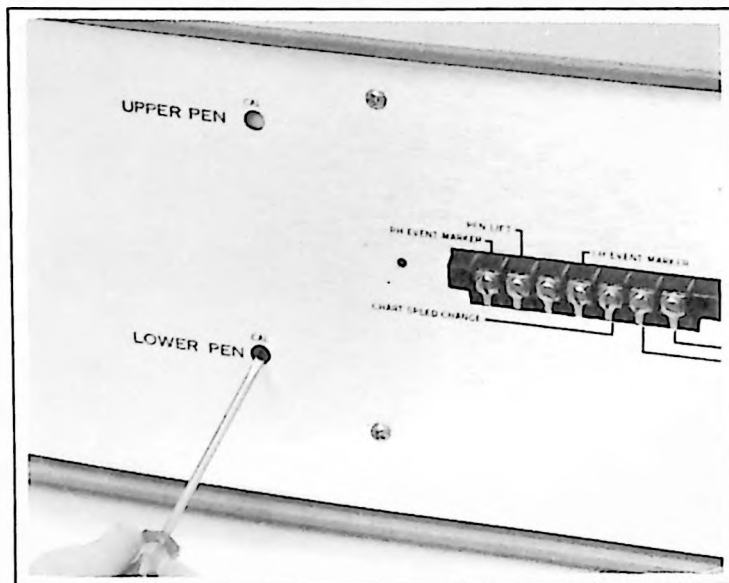


Figure 5-21. CAL Adjustment



## SECTION VI

### PARTS LIST

#### 6-1. INTRODUCTION.

6-2. This section contains complete information on the 7132A and 7133A Parts List. The lists of both models are presented in an alphanumerical and numerical order. The procedure for ordering replacement parts for either instrument is also contained in this section.

#### 6-3. PARTS LIST.

##### 6-4. ALPHANUMERICAL TABLE.

6-5. Tables 6-1 and 6-2, parts list tables for the 7132A and 7133A present the material for each model in alphanumerical order of their reference designators of circuit symbols, the HP stock number of each part, the quantity (total quantity appears the first time the HP stock number appears), a five-digit manufacturer's code, and the manufacturer's part number. If a part does not have a designation, it will be listed at the end of the appropriate circuit symbol list (A1, A2, A3). At the end of the individual parts list, a code list of manufacturers is presented. This addition is a cross-reference to the five-digit code number assigned to a specific manufacturer in that the five-digit number is identified by name.

#### NOTE

Unless otherwise noted, all part numbers are applicable to both the Model 7132A and 7133A.

#### 6-6. MISCELLANEOUS PARTS.

6-7. Table 6-3 lists miscellaneous items not covered in the preceding tables. The items for each model will be listed by a part number, description, and quantity.

#### 6-8. CODE LIST OF MANUFACTURERS.

6-9. Table 6-4 lists the five-digit code numbers assigned to a specific manufacturer. These tables are a cross-reference to Tables 6-1 and 6-2 in that the five-digit number listed in Tables 6-1 and 6-2 are identified by name in this table.

#### 6-10. ILLUSTRATED PARTS BREAKDOWN.

6-11. Additional parts information is included to identify other subassemblies. This information is presented as a parts breakdown illustration with an accompanying legend. Figures 6-1 thru 6-6; 6-13 and 6-14 identify the 7132A mechanical parts. Figures 6-1; and 6-7 thru 6-14 identify the 7133A mechanical parts.

#### 6-12. RECOMMENDED SPARES.

6-13. To obtain recommended spare parts for maintaining the instruments for a one-year period, contact the local Hewlett-Packard Sales/Service Office (see insert pages at back of the manual for addresses).

#### 6-14. ORDERING INFORMATION.

6-15. To obtain replacement parts, address order or inquiry to your local Hewlett-Packard Sales/Service Office (see insert pages at back of manual for address of nearest HP office). The order should include part number and description used in this section, model and serial number, description of the part, and function and location of the part.

Table 6-1. Parts List — Model 7132A

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A1	07130-61890	1	STANDARD MOTHER BOARD	28480	07130-61890
A1C1	0180-0334	3	CAPACITOR-FXD; 1200UF+75-10% 25VDC AL	56289	3401286020JJ4
A1C2	0180-0334	1	CAPACITOR-FXD; 1200UF+75-10% 25VDC AL	56289	3401286020JJ4
A1C3	0180-0334	1	CAPACITOR-FXD; 1200UF+75-10% 25VDC AL	56289	3401286020JJ4
A1C4	0180-0335	1	CAPACITOR-FXD; 5300UF+75-10% 15VDC AL	56289	3605326015AB69
A1C5	0160-0174	3	CAPACITOR-FXD .47UF +80-20% 25 WVDC CER	28480	0160-0174
A1C6	0160-0174	1	CAPACITOR-FXD .47UF +80-20% 25 WVDC CER	28480	0160-0174
A1C9	0180-2240	1	CAPACITOR-FXD; 2400UF+75-10% 25VDC AL	56289	3902486025JL2
A1C10	0160-3390	1	CAPACITOR-FXD .15UF +-10% 400WVDC MET	14752	X21091E154K
A1C11	0180-2457	1	CAPACITOR-FXD; 3900UF+75-10% 75VDC AL	56289	3603926075BB28
A1C12	0160-0012	1	CAPACITOR-FXD 1500PF +-10% 600WVDC PPR	56289	160P15295
A1CR1	1901-0363	2	DIODE; MULT; FULL WAVE BRIDGE RECTIFIER	04713	SDA 10185-3
A1CR2	1901-0363	2	DIODE; MULT; FULL WAVE BRIDGE RECTIFIER	28480	1901-1638
A1CR3	1901-0363	1	DIODE; MULT; FULL WAVE BRIDGE RECTIFIER	04713	SDA 10185-3
A1CR4	1901-0638	1	DIODE; MULT; FULL WAVE BRIDGE RECTIFIER	28480	1901-0638
A1CR5	1901-0159	2	DIODE-PWR RECT 400V 750MA	04713	SR1358-4
A1CR6	1901-0159	1	DIODE-PWR RECT 400V 750MA	04713	SR1358-4
A1CR7	1901-0416	2	DIODE-PWR RECT 400V 1.5A	04713	SR1946-12
A1CR8	1901-0418	1	DIODE-PWR RECT 400V 1.5A	04713	SR1846-12
A1F1	2110-0304	4	FUSE 1.5A 250V SLC-BLO	71400	MDX-1-1/2A
A1F2	2110-0304	1	FUSE 1.5A 250V SLC-BLO	71400	MDX-1-1/2A
A1F3	2110-0304	1	FUSE 1.5A 250V SLC-BLO	71400	MDX-1-1/2A
A1F4	2110-0304	1	FUSE 1.5A 250V SLC-BLO	71400	MDX-1-1/2A
A1F5	2110-0063	1	FUSE .75A 250V	71400	AGC-3/4
A1F6	2110-0043	1	FUSE 1.5A 250V	71400	AGC 1-1/2
A1J1	1251-1626	5	CONNECTOR; PC EDGE; 12-CONT; DIP SOLDER	71785	252-12-30-300
A1J2	1251-1626	1	CONNECTOR; PC EDGE; 12-CONT; DIP SOLDER	71785	252-12-30-300
A1J3	1251-1626	1	CONNECTOR; PC EDGE; 12-CONT; DIP SOLDER	71785	252-12-30-300
A1J4	1251-1626	1	CONNECTOR; PC EDGE; 12-CONT; DIP SOLDER	71785	252-12-30-300
A1J5	1251-2034	2	CONNECTOR; PC EDGE; 10-CONT; DIP SOLDER	71785	252-10-30-300
A1J6	1251-2034	1	CONNECTOR; PC EDGE; 10-CONT; DIP SOLDER	71785	252-10-30-300
A1J7	1251-2026	1	CONNECTOR; PC EDGE; 18-CONT; DIP SOLDER	71785	252-18-30-300
A1J10	1251-1626	1	CONNECTOR; PC EDGE; 12-CONT; DIP SOLDER	71785	252-12-30-300
A1R1	0757-0833	4	RESISTOR 5.11K 1% .5W F TUBULAR	30983	MF7C1/2-T0-5111-F
A1R2	0757-0833	1	RESISTOR 5.11K 1% .5W F TUBULAR	30983	MF7C1/2-T0-5111-F
A1R3	0757-0833	1	RESISTOR 5.11K 1% .5W F TUBULAR	30983	MF7C1/2-T0-5111-F
A1R4	0757-0833	1	RESISTOR 5.11K 1% .5W F TUBULAR	30983	MF7C1/2-T0-5111-F
A1R5	0757-0984	2	RESISTOR 10 OHM 1% .5W F TUBULAR	30983	MF7C1/2-T0-10R0-F
A1R6	0757-0984	1	RESISTOR 10 OHM 1% .5W F TUBULAR	30983	MF7C1/2-T0-10R0-F
A1R7	0757-0824	1	RESISTOR 2K 1% .5W F TUBULAR	30983	MF7C1/2-T0-2001-F
A1R8	0757-0839	1	RESISTOR 10K 1% .5W F TUBULAR	30983	MF7C1/2-T0-1002-F
A1R9	0812-0046	2	RESISTOR 2 OHM 5% 5W PW TUBULAR	91637	CW5-2-5W-T2-2R0-J
A1R10	0812-0046	1	RESISTOR 2 OHM 5% 5W PW TUBULAR	91637	CW5-2-5W-T2-2R0-J
A1XF1	2110-0269	4	FUSEHOLDER;	28480	2110-0269
	1400-0462	1	CLAMP; CABLE TIE; .14 W NYL	06383	PLT31-MPB
	5020-0495	1	PIN:SQUARE( TEST POINTS)	28480	5020-0495

See introduction to this section for ordering information

Table 6-1. Parts List — Model 7132A (Continued)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A2	07130-60200	1	SERVO AMPLIFIER BOARD ASSY	28480	07130-60200
A2C1	0160-2199	2	CAPACITOR-FXD 30PF $\pm 5\%$ 300WVDC MICA	28480	0160-2199
A2C2	0160-2211	1	CAPACITOR-FXD 510PF $\pm 5\%$ 300WVDC MICA	28480	0160-2211
A2C3	0160-2204	6	CAPACITOR-FXD 100PF $\pm 5\%$ 300WVDC MICA	28480	0160-2204
A2C4	0180-0229	2	CAPACITOR-FXD; 33UF $\pm 10\%$ 10VDC TA-SOLID	56289	150D336X901082
A2C5	0180-0229		CAPACITOR-FXD; 33UF $\pm 10\%$ 10VDC TA-SOLID	56289	150D336X901082
A2C6	0160-3387	1	CAPACITOR-FXD .39UF $\pm 10\%$ 80WVDC POLYE	56289	292P3949R8
A2C7	0160-2204		CAPACITOR-FXD 100PF $\pm 5\%$ 300WVDC MICA	28480	0160-2204
A2C8	0160-2204		CAPACITOR-FXD 100PF $\pm 5\%$ 300WVDC MICA	28480	0160-2204
A2C9	0160-2204		CAPACITOR-FXD 100PF $\pm 5\%$ 300WVDC MICA	28480	0160-2204
A2C10	0160-0174	1	CAPACITOR-FXD .47UF $\pm 80-20\%$ 25WVDC CER	28480	0160-0174
A2C11	0160-0859	2	CAPACITOR-FXD 1UF $\pm 10\%$ 50WVDC POLYE	56289	148P335-PUM
A2C12	0160-0297	1	CAPACITOR-FXD 1200PF $\pm 10\%$ 200WVDC POLYE	56289	292P12292
A2C13	0160-0859		CAPACITOR-FXD 1UF $\pm 10\%$ 50WVDC POLYE	56289	148P335-PUM
A2CR1	1902-3149	2	DIODE-ZNR 9.09V 5% DO-7 PD=.4W	04713	SZ 10939-170
A2CR2	1902-3149		DIODE-ZNR 9.09V 5% DO-7 PD=.4W	04713	SZ 10939-170
A2CR3	1901-0033	11	DIODE-GEN PRP 180V 200MA	28480	1901-0033
A2CR4	1901-0033		DIODE-GEN PRP 180V 200MA	28480	1901-0033
A2CR5	1901-0033		DIODE-GEN PRP 180V 200MA	28480	1901-0033
A2CR6	1901-0033		DIODE-GEN PRP 180V 200MA	28480	1901-0033
A2CR7	1901-0033		DIODE-GEN PRP 180V 200MA	28480	1901-0033
A2CR8	1901-0033		DIODE-GEN PRP 180V 200MA	28480	1901-0033
A2CR9	1901-0033		DIODE-GEN PRP 180V 200MA	28480	1901-0033
A2CR11	1901-0033		DIODE-GEN PRP 180V 200MA	28480	1901-0033
A2CR12	1901-0033		DIODE-GEN PRP 180V 200MA	28480	1901-0033
A2CR13	1901-0033		DIODE-GEN PRP 180V 200MA	28480	1901-0033
A2CR14	1901-0040	35	DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A2CR15	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A2CR16	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A2CR17	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A2CR18	1902-0777	2	DIODE; ZENER; 6.2V VZ; .25W MAX PD	04713	1N825
A2CR19	1902-0777		DIODE; ZENER; 6.2V VZ; .25W MAX PD	04713	1N825
A2IC1	1820-0223	10	IC LIN LM301AH AMPLIFIER	27014	LM301AH
A2IC2	1820-0223		IC LIN LM301AH AMPLIFIER	27014	LM301AH
A2IC3	1820-0223		IC LIN LM301AH AMPLIFIER	27014	LM301AH
A2IC4	1820-0223		IC LIN LM301AH AMPLIFIER	27014	LM301AH
A2IC5	1820-0223		IC LIN LM301AH AMPLIFIER	27014	LM301AH
A2IC6	1820-0223		IC LIN LM301AH AMPLIFIER	27014	LM301AH
A2R1	0698-0092	1	RESISTOR 2.61K 1% .125W F TUBULAR	03888	PME55-1/8-T0-2611-F
A2R2	0698-7879	1	RESISTOR 14.3K 1% .125W F TUBULAR	30983	MF4C1/8-T9-1435-F
A2R3	0811-2611	1	RESISTOR 17.4K 1% .25W PWM TUBULAR	14140	1250-1/4-D-1742
A2R4	2100-1757	1	RESISTOR-VAR TRMR 500 OHM 5% WW TOP ADJ	68027	CT-106-4
A2R5	0698-0085	1	RESISTOR 2.61K 1% .125W F TUBULAR	16299	C4-1/8-T0-2611-F
A2R6	0698-3158	1	RESISTOR 23.7K 1% .125W F TUBULAR	16299	C4-1/8-T0-2372-F
A2R7	0698-3162	4	RESISTOR 46.4K 1% .125W F TUBULAR	16299	C4-1/8-T0-4642-F
A2R8	0757-0280	9	RESISTOR 1K 1% .125W F TUBULAR	24546	C4-1/8-T0-1001-F
A2R9	0698-3449	2	RESISTOR 28.7K 1% .125W F TUBULAR	16299	C4-1/8-T0-2872-F
A2R10	0757-0416	3	RESISTOR 511 OHM 1% .125W F TUBULAR	24546	C4-1/8-T0-511R-F
A2R11	0698-3161	2	RESISTOR 38.3K 1% .125W F TUBULAR	16299	C4-1/8-T0-3832-F
A2R12	0757-0416		RESISTOR 511 OHM 1% .125W F TUBULAR	24546	C4-1/8-T0-511R-F
A2R13	0757-0815	2	RESISTOR 562 OHM 1% .5W F TUBULAR	30983	MF7C1/2-T0-562R-F
A2R14	0757-0815		RESISTOR 562 OHM 1% .5W F TUBULAR	30983	MF7C1/2-T0-562R-F
A2R15	0757-0465	7	RESISTOR 100K 1% .125W F TUBULAR	24546	C4-1/8-T0-1003-F
A2R16	2100-3350	2	RESISTOR-VAR TRMR 200 OHM 10% C SIDE ADJ	73138	72XR201
A2R17	0757-0284	2	RESISTOR 150 OHM 1% .125W F TUBULAR	24546	C4-1/8-T0-151-F
A2R18	0757-0443	1	RESISTOR 11K 1% .125W F TUBULAR	24546	C4-1/8-T0-1102-F
A2R19	2100-3350		RESISTOR-VAR TRMR 200 OHM 10% C SIDE ADJ	73138	72XR201
A2R20	0757-0284		RESISTOR 150 OHM 1% .125W F TUBULAR	24546	C4-1/8-T0-151-F
A2R21	0757-0465		RESISTOR 100K 1% .125W F TUBULAR	24546	C4-1/8-T0-1003-F
A2R22	0757-0401	5	RESISTOR 100 OHM 1% .125W F TUBULAR	24546	C4-1/8-T0-101-F
A2R23	0757-0199	1	RESISTOR 21.5K 1% .125W F TUBULAR	24546	C4-1/8-T0-2152-F
A2R24	0757-0439	6	RESISTOR 6.81K 1% .125W F TUBULAR	24546	C4-1/8-T0-6811-F
A2R26	0698-3157	3	RESISTOR 19.6K 1% .125W F TUBULAR	16299	C4-1/8-T0-1962-F
A2R28	0698-3157		RESISTOR 19.6K 1% .125W F TUBULAR	16299	C4-1/8-T0-1962-F
A2R31	0698-3161		RESISTOR 38.3K 1% .125W F TUBULAR	16299	C4-1/8-T0-3832-F
A2R33	0757-0401		RESISTOR 100 OHM 1% .125W F TUBULAR	24546	C4-1/8-T0-101-F
A2R34	0698-3457	3	RESISTOR 316K 1% .125W F TUBULAR	19701	MF4C1/8-T0-3163-F
A3	07130-60100	1	POWER SUPPLY BOARD ASSY	28480	07130-60100

See introduction to this section for ordering information



Table 6-1. Parts List — Model 7132A (Continued)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A3C1	0180-2493	2	CAPACITOR-FXD; 150UF+75-10% 50VDC AL	56289	39D157G050EL4
A3C2	0180-0058	3	CAPACITOR-FXD; 50UF+75-10% 25VDC AL	56289	30D506G025CC2
A3C3	0160-0153	2	CAPACITOR-FXD 1000PF +-10% 200WVDC POLYE	56289	292P10292
A3C4	0160-0153		CAPACITOR-FXD 1000PF +-10% 200WVDC POLYE	56289	292P10292
A3C5	0180-2493		CAPACITOR-FXD; 150UF+75-10% 50VDC AL	56289	39D157G050EL4
A3C6	0180-0058		CAPACITOR-FXD; 50UF+75-10% 25VDC AL	56289	30D506G025CC2
A3CR1	1901-0022	3	DIODE-STABISTOR 10V 250MA	28480	1901-0022
A3CR2	1902-0048	2	DIODE-ZNR 6.81V 5% DO-7 PD=.4W	28480	1902-0048
A3CR3	1901-0022		DIODE-STABISTOR 10V 250MA	28480	1901-0022
A3CR4	1902-0048		DIODE-ZNR 6.81V 5% DO-7 PD=.4W	28480	1902-0048
A3Q1	1855-0362	2	TRANSISTOR; J-FET P-CHAN, D-MODE SI	28480	1855-0362
A3Q2	1854-0087	7	TRANSISTOR NPN SI PD=360MW FT=75MHZ	28480	1854-0087
A3Q3	1854-0087		TRANSISTOR APN SI PD=360MW FT=75MHZ	28480	1854-0087
A3Q4	1855-0362		TRANSISTOR; J-FET P-CHAN, D-MODE SI	28480	1855-0362
A3Q5	1853-0086	3	TRANSISTOR PNP SI CHIP PD=310MW	28480	1853-0086
A3Q6	1853-0086		TRANSISTOR PNP SI CHIP PD=310MW	28480	1853-0086
A3R1	0698-5525	2	RESISTOR 6.8 OHM 5% .5W CC TUBULAR	01121	EB68G5
A3R2	0698-3200	2	RESISTOR 8K 1% .125W F TUBULAR	16299	C4-1/8-T0-8001-F
A3R3	0757-0288	2	RESISTOR 9.09K 1% .125W F TUBULAR	30983	MF4C1/8-T0-9091-F
A3R4	0757-0346	2	RESISTOR 10 OHM 1% .125W F TUBULAR	24546	C4-1/8-T0-10R0-F
A3R5	0757-0346		RESISTOR 10 OHM 1% .125W F TUBULAR	24546	C4-1/8-T0-10R0-F
A3R6	0757-0288		RESISTOR 9.09K 1% .125W F TUBULAR	30983	MF4C1/8-T0-9091-F
A3R7	0698-5525		RESISTOR 6.8 OHM 5% .5W CC TUBULAR	01121	EB68G5
A3R8	0698-3200		RESISTOR 8K 1% .125W F TUBULAR	16299	C4-1/8-T0-8001-F
A4	07130-61310	1	PREAMPLIFIER BOARD ASSY	28480	07130-61310
A4C1	0150-0121	2	CAPACITOR-FXD .1UF +80-20% 50WVDC CER	28480	0150-0121
A4C2	0150-0121		CAPACITOR-FXD .1UF +80-20% 50WVDC CER	28480	0150-0121
A4C3	0160-0205	2	CAPACITOR-FXD 10PF +-5% 500WVDC MICA 0+	28480	0160-0205
A4C4	0160-0205		CAPACITOR-FXD 10PF +-5% 500WVDC MICA 0+	28480	0160-0205
A4C5	0160-3532	2	CAPACITOR-FXD .056UF +-2% 200WVDC MET	28480	0160-3532
A4C6	0180-0195	1	CAPACITOR-FXD; .33UF+-20% 35VDC TA	56289	150D334X0035A2
A4C7	0160-3532		CAPACITOR-FXD .056UF +-2% 200WVDC MET	28480	0160-3532
A4C8	0160-0168	4	CAPACITOR-FXD .1UF +-10% 200WVDC POLYE	56289	292P10492
A4C9	0180-0197	5	CAPACITOR-FXD; 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A4C10	0180-0291	2	CAPACITOR-FXD; 1UF+-10% 35VDC TA-SOLID	56289	150D105X9035A2
A4C11	0180-0116	1	CAPACITOR-FXD; 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A4C12	0180-0058		CAPACITOR-FXD; 50UF+75-10% 25VDC AL	56289	30D506G025CC2
A4C13	0180-0197		CAPACITOR-FXD; 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A4C14	0180-0106	1	CAPACITOR-FXD; 60UF+-20% 6VDC TA-SOLID	56289	150D606X0006B2
A4C15	0160-2199		CAPACITOR-FXD 30PF +-5% 300WVDC MICA	28480	0160-2199
A4C16	0180-0197		CAPACITOR-FXD; 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A4C17	0180-0197		CAPACITOR-FXD; 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A4C18	0160-2204		CAPACITOR-FXD 100PF +-5% 300WVDC MICA	28480	0160-2204
A4C19	0160-3518	1	CAPACITOR-FXD 1UF +-5% 100WVDC MET POLYE	84411	HEW 186
A4C20	0160-2204		CAPACITOR-FXD 100PF +-5% 300WVDC MICA	28480	0160-2204
A4CR1	1902-0049	2	DIODE-ZNR 6.19V 5% DO-7 PD=.4W	28480	1902-0049
A4CR2	1901-0040		DIODE-SWITCHING 2N5 30V 50MA	28480	1901-0040
A4CR3	1901-0040		DIODE-SWITCHING 2N5 30V 50MA	28480	1901-0040
A4CR4	1902-0049		DIODE-ZNR 6.19V 5% DO-7 PD=.4W	28480	1902-0049
A4CR5	1901-0040		DIODE-SWITCHING 2N5 30V 50MA	28480	1901-0040
A4CR6	1901-0040		DIODE-SWITCHING 2N5 30V 50MA	28480	1901-0040
A4CR7	1901-0040		DIODE-SWITCHING 2N5 30V 50MA	28480	1901-0040
A4CR8	1901-0040		DIODE-SWITCHING 2N5 30V 50MA	28480	1901-0040
A4CR9	1901-0040		DIODE-SWITCHING 2N5 30V 50MA	28480	1901-0040
A4CR10	1901-0040		DIODE-SWITCHING 2N5 30V 50MA	28480	1901-0040
A4CR11	1990-0411	2	PHOTO-DEVICE; SW PNP-SI 3V .05MW PD	04713	MLED5U
A4CR12	1990-0411		PHOTO-DEVICE; SW PNP-SI 3V .05MW PD	04713	MLED5U
A4CR13	1902-0025	2	DIODE-ZNR 10V 5% DO-7 PD=.4W TC=+.06%	04713	SZ 10939-182
A4CR14	1902-0025		DIODE-ZNR 10V 5% DO-7 PD=.4W TC=+.06%	04713	SZ 10939-182
A4CR15	1901-0040		DIODE-SWITCHING 2N5 30V 50MA	28480	1901-0040
A4CR16	1901-0040		DIODE-SWITCHING 2N5 30V 50MA	28480	1901-0040
A4CR17	1901-0040		DIODE-SWITCHING 2N5 30V 50MA	28480	1901-0040
A4CR18	1901-0040		DIODE-SWITCHING 2N5 30V 50MA	28480	1901-0040
A4IC1	1820-0223		IC LIN LM301AH AMPLIFIER	27014	LM301AH
A4IC2	1820-0223		IC LIN LM301AH AMPLIFIER	27014	LM301AH
A4IC3	1820-0223		IC LIN LM301AH AMPLIFIER	27014	LM301AH
A4Q1	1853-0012	3	TRANSISTOR PNP 2N2904A SI CHIP	01295	2N2904A
A4Q2	1854-0087		TRANSISTOR NPN SI PD=360MW FT=75MHZ	28480	1854-0087
A4Q3	1854-0087		TRANSISTOR NPN SI PD=360MW FT=75MHZ	28480	1854-0087
A4Q4	1853-0012		TRANSISTOR PNP 2N2904A SI CHIP	01295	2N2904A
A4Q5	1854-0087		TRANSISTOR NPN SI PD=360MW FT=75MHZ	28480	1854-0087

See introduction to this section for ordering information



Table 6-1. Parts List — Model 7132A (Continued)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A4Q6	1854-0087	1	TRANSISTOR NPN SI PD=360MHZ FT=75MHZ	28480	1854-0087
A4Q7	5081-5004		TRANSISTOR, SELECTED 1855-0351	28480	5081-5004
A4Q8	1853-0086		TRANSISTOR PNP SI CHIP PD=310MHZ	28480	1853-0086
A4Q9	1855-0062		TRANSISTOR: J-FET N-CHAN, D-MODE SI	28480	1855-0062
A4Q10	1855-0062		TRANSISTOR: J-FET N-CHAN, D-MODE SI	28480	1855-0062
A4R1	0757-0465	2	RESISTOR 100K 1% .125W F TUBULAR	24546	C4-1/8-T0-1003-F
A4R2	0698-3399		RESISTOR 133 OHM 1% .5W F TUBULAR	19701	MF7C1/2-T0-133R-F
A4R3	0757-0469		RESISTOR 150K 1% .125W F TUBULAR	24546	C4-1/8-T0-1503-F
A4R4	0757-0283		RESISTOR 2K 1% .125W F TUBULAR	24546	C4-1/8-T0-2001-F
A4R5	0757-0469		RESISTOR 150K 1% .125W F TUBULAR	24546	C4-1/8-T0-1503-F
A4R6	0757-0469	3	RESISTOR 150K 1% .125W F TUBULAR	24546	C4-1/8-T0-1503-F
A4R7	0757-0283		RESISTOR 2K 1% .125W F TUBULAR	24546	C4-1/8-T0-2001-F
A4R8	0698-3260		RESISTOR 464K 1% .125W F TUBULAR	19701	MF4C1/8-T0-4643-F
A4R9	0698-3260		RESISTOR 464K 1% .125W F TUBULAR	19701	MF4C1/8-T0-4643-F
A4R10	0698-3399		RESISTOR 133 OHM 1% .5W F TUBULAR	19701	MF7C1/2-T0-133R-F
A4R11	0757-0465	2	RESISTOR 100K 1% .125W F TUBULAR	24546	C4-1/8-T0-1003-F
A4R12	0757-0469		RESISTOR 150K 1% .125W F TUBULAR	24546	C4-1/8-T0-1503-F
A4R13	0757-0459		RESISTOR 56.2K 1% .125W F TUBULAR	24546	C4-1/8-T0-5622-F
A4R14	0757-0465		RESISTOR 100K 1% .125W F TUBULAR	24546	C4-1/8-T0-1003-F
A4R15	0757-0465		RESISTOR 100K 1% .125W F TUBULAR	24546	C4-1/8-T0-1003-F
A4R16	0757-0442	14	RESISTOR 10K 1% .125W F TUBULAR	24546	C4-1/8-T0-1002-F
A4R17	0757-0442		RESISTOR 10K 1% .125W F TUBULAR	24546	C4-1/8-T0-1002-F
A4R18	0757-0442		RESISTOR 10K 1% .125W F TUBULAR	24546	C4-1/8-T0-1002-F
A4R19	0757-0442		RESISTOR 10K 1% .125W F TUBULAR	24546	C4-1/8-T0-1002-F
A4R20	0757-0459		RESISTOR 56.2K 1% .125W F TUBULAR	24546	C4-1/8-T0-5622-F
A4R21	0757-0440	1	RESISTOR 7.5K 1% .125W F TUBULAR	24546	C4-1/8-T0-7501-F
A4R22	0698-3162		RESISTOR 46.4K 1% .125W F TUBULAR	16299	C4-1/8-T0-4642-F
A4R23	0698-3162		RESISTOR 46.4K 1% .125W F TUBULAR	16299	C4-1/8-T0-4642-F
A4R24	0757-0449		RESISTOR 20K 1% .125W F TUBULAR	24546	C4-1/8-T0-2002-F
A4R25	0698-3438		RESISTOR 147 OHM 1% .125W F TUBULAR	16299	C4-1/8-T0-147R-F
A4R26	0698-3162	8	RESISTOR 46.4K 1% .125W F TUBULAR	16299	C4-1/8-T0-4642-F
A4R27	0698-3260		RESISTOR 464K 1% .125W F TUBULAR	19701	MF4C1/8-T0-4643-F
A4R28	0757-0438		RESISTOR 5.11K 1% .125W F TUBULAR	24546	C4-1/8-T0-5111-F
A4R29	0757-0280		RESISTOR 1K 1% .125W F TUBULAR	24546	C4-1/8-T0-1001-F
A4R30	0757-0283		RESISTOR 2K 1% .125W F TUBULAR	24546	C4-1/8-T0-2001-F
A4R31	0757-0442	1	RESISTOR 10K 1% .125W F TUBULAR	24546	C4-1/8-T0-1002-F
A4R32	2100-2633		RESISTOR; VAR; TRMR; 1KOHM 10% C	19701	ET50X102
A4R33	0683-7545		RESISTOR 750K 5% .25W CC TUBULAR	01121	CB7545
A4R34	0686-1065		RESISTOR 10M 5% .5W CC TUBULAR	01121	EB1065
A4R35	0686-1065		RESISTOR 10M 5% .5W CC TUBULAR	01121	EB1065
A4R36	0757-0442	1	RESISTOR 10K 1% .125W F TUBULAR	24546	C4-1/8-T0-1002-F
A4R37	0757-0442		RESISTOR 10K 1% .125W F TUBULAR	24546	C4-1/8-T0-1002-F
A4R38	0757-0442		RESISTOR 10K 1% .125W F TUBULAR	24546	C4-1/8-T0-1002-F
A4R40	0698-3457		RESISTOR 316K 1% .125W F TUBULAR	19701	MF4C1/8-T0-3163-F
A4R41	0698-3457		RESISTOR 316K 1% .125W F TUBULAR	19701	MF4C1/8-T0-3163-F
A4	07130-61410	1	CHOPPER BOARD ASSY	28480	07130-61410
A4 C21	0160-0168	1	CAPACITOR-FXO .1UF +-10% 200MVDC POLYE	56289	292P10492
A4 R42	1990-0305	2	PHOTO-CELL:5K/100 MEGOHM 50%	28480	1990-0305
A4 R43	1990-0305		PHOTO-CELL:5K/100 MEGOHM 50%	28480	1990-0305
A4 R44	0683-1035	1	RESISTOR 10K 5% .25W CC TUBULAR	01121	CB1035
A4S1	07130-61315	1	SWITCH-RANGE ASSY	28480	07130-61315
A4S1	3100-3297	1	SWITCH, ROTARY	28480	3100-3297
A4S1R11	0698-6305	1	RESISTOR 900K .1% .25W F TUBULAR	19701	MF52C1/4-T9-9003-B
A4S1R12	0683-9135	3	RESISTOR 91K 5% .25W CC TUBULAR	01121	CB9135
A4S1R13	0698-6342	1	RESISTOR 90K .1% .125W F TUBULAR	19701	MF4C1/8-T9-9002-B
A4S1R14	0683-8235	1	RESISTOR 82K 5% .25W CC TUBULAR	01121	CB8235
A4S1R15	0698-6343	1	RESISTOR 9K .1% .125W F TUBULAR	19701	MF4C1/8-T9-9001-B
A4S1R16	0683-9135	1	RESISTOR 91K 5% .25W CC TUBULAR	01121	CB9135
A4S1R17	0698-6344		RESISTOR 900 OHM .1% .125W F TUBULAR	19701	MF4C1/8-T9-900R-B
A4S1R18	0683-9135		RESISTOR 91K 5% .25W CC TUBULAR	01121	CB9135
A4S1R19	0698-6323	1	RESISTOR 100 OHM .1% .125W F TUBULAR	19701	MF4C1/8-T9-100R-B
A4S1R20	0698-6362	1	RESISTOR 1K .1% .125W F TUBULAR	19701	MF4C1/8-T9-1001-B
A4S1R21	0698-6322	1	RESISTOR 4K .1% .125W F TUBULAR	19701	MF4C1/8-T9-4001-B
A4S1R22	0698-6320	1	RESISTOR 5K .1% .125W F TUBULAR	03888	PME55-1/8-T9-5001-B
A4S1R23	0698-6363	1	RESISTOR 40K .1% .125W F TUBULAR	19701	MF4C1/8-T9-4002-B
A4S1R25	0757-0200	1	RESISTOR 5.62K 1% .125W F TUBULAR	24546	C4-1/8-T0-5621-F
A4S1R26	0757-0274	1	RESISTOR 1.21K 1% .125W F TUBULAR	24546	C4-1/8-T0-1213-F
A4S1R27	0757-0416	2	RESISTOR 511 OHM 1% .125W F TUBULAR	24546	C4-1/8-T0-511R-F
A4S1R28	0757-0420		RESISTOR 750 OHM 1% .125W F TUBULAR	24546	C4-1/8-T0-751-F
A4S1R29	0698-5672	1	RESISTOR 2.7K 1% .125W F TUBULAR	19701	MF4C1/8-T9-2701-F
A4S1R30	2100-3393	1	RESISTOR, VAR W/SW. 50K 10% LIN	28480	2100-3393
A4S1R31	0757-0261	1	RESISTOR 953K 1% .5W F TUBULAR	30983	MF7C1/2-T9-9533-F
A4S1Z	2190-0027	1	WASHER-LK INTL T NO. 1/4 .256 IN D	78189	1914-00
A4S2	2950-0043	1	NUT-HEX-DBL CHAM 3/8-32-THD .094-THK	73743	2X 28200
	2100-3393	1	SWITCH, PART OF 2100-3393(R-V)	28480	2100-3393

See introduction to this section for ordering information

Table 6-1. Parts List — Model 7132A (Continued)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A7	07130-60830	1	STANDARD FRAME OPTIONS BOARD	28480	07130-60830
A7C1	0160-0168	2	CAPACITOR-FXD .1UF +-10% 200WVDC POLYE	56289	292P10492
A7C2	0180-1819		CAPACITOR-FXD; 100UF+75-10% 50VDC AL	56289	300107G0500H2
A7C3	0160-0168	1	CAPACITOR-FXD .1UF +-10% 200WVDC POLYE	56289	292P10492
A7C4	0180-0137		CAPACITOR-FXD; 100UF+-20% 10VDC TA	56289	150D107X0010R2
A7CR1	1901-0040	1	DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR2	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR3	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR4	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR5	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR6	1901-0040	1	DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR7	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR8	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR9	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR10	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR11	1901-0040	1	DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR12	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR13	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR14	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR15	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR16	1902-3071	2	DIODE-ZNR 4.22V 2% DO-7 PD=.4W TC=	04713	SZ 10939-75
A7CR17	1901-0022		DIODE-STABISTOR 10V 250MA	28480	1901-0022
A7CR18	1902-0078	1	DIODE-ZNR 14.7V 2% DO-7 PD=.4W	28480	1902-0078
A7CR19	1902-3071		DIODE-ZNR 4.22V 2% DO-7 PD=.4W TC=	04713	SZ 10939-75
A7CR20	1901-0040	1	DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR21	1901-0040	1	DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR22	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR23	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7K1	0490-1088	1	RELAY; 24VDC; CONT 1A 28VDC FORM 2C	28480	0490-1088
A7Q1	1854-0071	8	TRANSISTOR NPN SI PD=300MW FT=200MHZ	28480	1854-0071
A7Q2	1854-0039		TRANSISTOR NPN 2N3053 SI PD=1W	04713	2N3053
A7Q3	1854-0039		TRANSISTOR NPN 2N3053 SI PD=1W	04713	2N3053
A7Q4	1854-0039		TRANSISTOR NPN 2N3053 SI PD=1W	04713	2N3053
A7Q5	1854-0071		TRANSISTOR NPN SI PD=300MW FT=200MHZ	28480	1854-0071
A7Q6	1854-0039	1	TRANSISTOR NPN 2N3053 SI PD=1W	04713	2N3053
A7Q7	1854-0086		TRANSISTOR NPN SI TO-3 PD=75W FT=6MHZ	28480	1854-0086
A7Q8	1854-0039		TRANSISTOR NPN 2N3053 SI PD=1W	04713	2N3053
A7Q9	1854-0067		TRANSISTOR NPN SI PD=360MW FT=75MHZ	28480	1854-0087
A7Q10	1854-0039		TRANSISTOR NPN 2N3053 SI PD=1W	04713	2N3053
A7Q11	1854-0071	1	TRANSISTOR NPN SI PD=300MW FT=200MHZ	28480	1854-0071
A7Q12	1854-0071		TRANSISTOR NPN SI PD=300MW FT=200MHZ	28480	1854-0071
A7Q13	1854-0039		TRANSISTOR NPN 2N3053 SI PD=1W	04713	2N3053
A7R1	0757-0442	1	RESISTOR 10K 1% .125W F TUBULAR	24546	C4-1/8-T0-1002-F
A7R2	0698-3637		RESISTOR 820 OHM 5% 2W MO TUBULAR	24546	FP42-2-T00-820R-J
A7R3	0757-0439		RESISTOR 6.81K 1% .125W F TUBULAR	24546	C4-1/8-T0-6811-F
A7R4	0757-0449		RESISTOR 20K 1% .125W F TUBULAR	24546	C4-1/8-T0-2002-F
A7R5	0757-0439		RESISTOR 6.81K 1% .125W F TUBULAR	24546	C4-1/8-T0-6811-F
A7R6	0757-0449	2	RESISTOR 20K 1% .125W F TUBULAR	24546	C4-1/8-T0-2002-F
A7R7	0757-0439		RESISTOR 6.81K 1% .125W F TUBULAR	24546	C4-1/8-T0-6811-F
A7R8	0757-0449		RESISTOR 20K 1% .125W F TUBULAR	24546	C4-1/8-T0-2002-F
A7R9	0698-3410		RESISTOR 3.16K 1% .5W F TUBULAR	19701	MF7C1/2-T0-3161-F
A7R10	0757-0439		RESISTOR 6.81K 1% .125W F TUBULAR	24546	C4-1/8-T0-6811-F
A7R11	0757-0755	1	RESISTOR 75 OHM 1% .5W F TUBULAR	30983	MF-1/2-T0-75R0-F
A7R12	0757-0420	1	RESISTOR 750 OHM 1% .125W F TUBULAR	24546	C4-1/8-T0-751-F
A7R13	0757-0839		RESISTOR 10K 1% .5W F TUBULAR	30983	MF7C1/2-T0-1002-F
A7R14	0757-0401	1	RESISTOR 100 OHM 1% .125W F TUBULAR	24546	C4-1/8-T0-101-F
A7R15	0698-3136		RESISTOR 17.8K 1% .125W F TUBULAR	16299	C4-1/8-T0-1782-F
A7R16	0698-3157	1	RESISTOR 19.6K 1% .125W F TUBULAR	16299	C4-1/8-T0-1962-F
A7R17	0757-0984		RESISTOR 10 OHM 1% .5W F TUBULAR	30983	MF7C1/2-T0-10R0-F
A7R18	0757-0438	1	RESISTOR 5.11K 1% .125W F TUBULAR	24546	C4-1/8-T0-5111-F
A7R19	0698-3406		RESISTOR 1.33K 1% .5W F TUBULAR	19701	MF7C1/2-T0-1331-F
A7R20	0757-0401		RESISTOR 100 OHM 1% .125W F TUBULAR	24546	C4-1/8-T0-101-F
A7R21	0757-0449	1	RESISTOR 20K 1% .125W F TUBULAR	24546	C4-1/8-T0-2002-F
A7R22	0698-3410		RESISTOR 3.16K 1% .5W F TUBULAR	19701	MF7C1/2-T0-3161-F
A7R23	0757-0439		RESISTOR 6.81K 1% .125W F TUBULAR	24546	C4-1/8-T0-6811-F
A9	07130-60700	1	STEPPER CHART DRIVE BOARD ASSY(8-SPEED)	28480	07130-60700
A9C1	0180-0291	1	CAPACITOR-FXD; 1UF+-10% 35VDC TA-SOLID	56289	150D105X9035A2
A9C2	0180-1743		CAPACITOR-FXD; .1UF+-10% 35VDC TA-SOLID	56289	150D104X9035A2
A9C3	0180-0197	2	CAPACITOR-FXD; 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A9C4	0180-1745		CAPACITOR-FXD; 1.5UF+-10% 20VDC TA	56289	150D155X9020A2
A9C5	0180-1745		CAPACITOR-FXD; 1.5UF+-10% 20VDC TA	56289	150D155X9020A2

See introduction to this section for ordering information

Table 6-1. Parts List — Model 7132A (Continued)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A9C6	0160-2215	1	CAPACITOR-FXD 750PF $\pm 5\%$ 300WVDC MICA	28480	0160-2215
A9C7	0150-0093	2	CAPACITOR-FXD .01UF $\pm 80-20\%$ 100WVDC CER	28480	0150-0093
A9C8	0150-0093		CAPACITOR-FXD .01UF $\pm 80-20\%$ 100WVDC CER	28480	0150-0093
A9C9	0180-0374	1	CAPACITOR-FXD; 10UF $\pm 10\%$ 20VDC TA-SOLID	56289	1500106X9020B2
A9CR1	1901-0050	2	DIODE-SWITCHING 2NS 80V 200MA	28480	1901-0050
A9CR2	1901-0050		DIODE-SWITCHING 2NS 80V 200MA	28480	1901-0050
A9CR3	1901-0158	5	DIODE-PWR RECT 200V 750MA	04713	SR1358-3
A9CR4	1901-0025	8	DIODE-GEN PRP 100V 200MA	28480	1901-0025
A9CR5	1901-0025		DIODE-GEN PRP 100V 200MA	28480	1901-0025
A9CR6	1901-0158		DIODE-PWR RECT 200V 750MA	04713	SR1358-3
A9CR7	1901-0025		DIODE-GEN PRP 100V 200MA	28480	1901-0025
A9CR8	1901-0025		DIODE-GEN PRP 100V 200MA	28480	1901-0025
A9CR9	1901-0158		DIODE-PWR RECT 200V 750MA	04713	SR1358-3
A9CR10	1901-0025		DIODE-GEN PRP 100V 200MA	28480	1901-0025
A9CR11	1901-0025		DIODE-GEN PRP 100V 200MA	28480	1901-0025
A9CR12	1901-0158		DIODE-PWR RECT 200V 750MA	04713	SR1358-3
A9CR13	1901-0025		DIODE-GEN PRP 100V 200MA	28480	1901-0025
A9CR14	1901-0025		DIODE-GEN PRP 100V 200MA	28480	1901-0025
A9CR15	1901-0158		DIODE-PWR RECT 200V 750MA	04713	SR1358-3
A9CR16	1902-3208	1	DIODE-ZNR 15.4V 5% DO-7 PD=.4W TC= $\pm .06\%$	04713	SZ 10939-236
A9IC1	1820-0223		IC LIN LM301AH AMPLIFIER	27014	LM301AH
A9IC2	1820-0630	1	IC:DGTL;MISCELLANEOUS (DIGITAL)	04713	MC4044P
A9IC3	1820-0567	1	IC DGTL MC 4024P MULTIVIBRATOR	04713	MC4024P
A9IC4	1820-0056	2	IC DGTL SN74 92 N COUNTER	01295	SN7492N
A9IC5	1820-0056		IC DGTL SN74 92 N COUNTER	01295	SN7492N
A9IC6	1820-0055	1	IC DGTL SN74 90 N COUNTER	01295	SN7490N
A9IC8	1820-0075	1	IC:DGTL;FLIP-FLOP	01295	SN7473N
A9Q1	1854-0071		TRANSISTOR NPN SI PD=300MW FT=200MHZ	28480	1854-0071
A9Q2	1855-0062		TRANSISTOR; J-FET N-CHAN, D-MODE SI	28480	1855-0062
A9Q3	1854-0071		TRANSISTOR NPN SI PD=300MW FT=200MHZ	28480	1854-0071
A9Q4	1854-0071		TRANSISTOR NPN SI PD=300MW FT=200MHZ	28480	1854-0071
A9Q5	1854-0071		TRANSISTOR NPN SI PD=300MW FT=200MHZ	28480	1854-0071
A9Q6	1854-0215	4	TRANSISTOR NPN SI PD=310MW FT=300MHZ	04713	SPS 3611
A9Q7	1854-0039		TRANSISTOR NPN 2N3053 SI PD=1W	04713	2N3053
A9Q8	1854-0215		TRANSISTOR NPN SI PD=310MW FT=300MHZ	04713	SPS 3611
A9Q9	1854-0039		TRANSISTOR NPN 2N3053 SI PD=1W	04713	2N3053
A9Q10	1854-0215		TRANSISTOR NPN SI PD=310MW FT=300MHZ	04713	SPS 3611
A9Q11	1854-0039		TRANSISTOR NPN 2N3053 SI PD=1W	04713	2N3053
A9Q12	1854-0215		TRANSISTOR NPN SI PD=310MW FT=300MHZ	04713	SPS 3611
A9Q13	1854-0039		TRANSISTOR NPN 2N3053 SI PD=1W	04713	2N3053
A9Q14	1854-0441	1	TRANSISTOR NPN SI PD=5.8W FT=800KHZ	28480	1854-0441
A9R1	0757-0461	2	RESISTOR 68.1K $1\%$ .125W F TUBULAR	24546	C4-1/8-T0-6812-F
A9R2	0698-3152	3	RESISTOR 3.48K $1\%$ .125W F TUBULAR	16299	C4-1/8-T0-3481-F
A9R3	0698-3152		RESISTOR 3.48K $1\%$ .125W F TUBULAR	16299	C4-1/8-T0-3481-F
A9R4	0757-0465		RESISTOR 100K $1\%$ .125W F TUBULAR	24546	C4-1/8-T0-1003-F
A9R5	0757-0283		RESISTOR 2K $1\%$ .125W F TUBULAR	24546	C4-1/8-T0-2001-F
A9R6	0757-0442		RESISTOR 10K $1\%$ .125W F TUBULAR	24546	C4-1/8-T0-1002-F
A9R7	0698-3449		RESISTOR 28.7K $1\%$ .125W F TUBULAR	16299	C4-1/8-T0-2872-F
A9R8	0757-1094	1	RESISTOR 1.47K $1\%$ .125W F TUBULAR	24546	C4-1/8-T0-1471-F
A9R9	0757-0438		RESISTOR 5.11K $1\%$ .125W F TUBULAR	24546	C4-1/8-T0-5111-F
A9R10	0757-0472	2	RESISTOR 200K $1\%$ .125W F TUBULAR	24546	C4-1/8-T0-2003-F
A9R11	0757-0472		RESISTOR 200K $1\%$ .125W F TUBULAR	24546	C4-1/8-T0-2003-F
A9R12	0757-0401		RESISTOR 100 OHM $1\%$ .125W F TUBULAR	24546	C4-1/8-T0-101-F
A9R13	2100-1788	1	RESISTOR; VAR; TRMR; 500 OHM $10\%$ C	30983	ET50W501
A9R14	0757-0461		RESISTOR 68.1K $1\%$ .125W F TUBULAR	24546	C4-1/8-T0-6812-F
A9R15	0757-0819	1	RESISTOR 909 OHM $1\%$ .5W F TUBULAR	30983	MF7C1/2-T0-909R-F
A9R15	0757-0280		RESISTOR 1K $1\%$ .125W F TUBULAR	24546	C4-1/8-T0-1001-F
A9R16	0757-0290	1	RESISTOR 6.19K $1\%$ .125W F TUBULAR	30983	MF4C1/8-T0-6191-F
A9R17	0757-0458	1	RESISTOR 51.1K $1\%$ .125W F TUBULAR	24546	C4-1/8-T0-5112-F
A9R18	0698-3152		RESISTOR 3.48K $1\%$ .125W F TUBULAR	16299	C4-1/8-T0-3481-F
A9R19	0698-0084	1	RESISTOR 2.15K $1\%$ .125W F TUBULAR	16299	C4-1/8-T0-2151-F
A9R20	0698-3447	1	RESISTOR 422 OHM $1\%$ .125W F TUBULAR	16299	C4-1/8-T0-422R-F
A9R21	0698-3446	1	RESISTOR 383 OHM $1\%$ .125W F TUBULAR	16299	C4-1/8-T0-383R-F
A9R22	0757-0438		RESISTOR 5.11K $1\%$ .125W F TUBULAR	24546	C4-1/8-T0-5111-F
A9R23	0757-0280		RESISTOR 1K $1\%$ .125W F TUBULAR	24546	C4-1/8-T0-1001-F
A9R24	0757-0280		RESISTOR 1K $1\%$ .125W F TUBULAR	24546	C4-1/8-T0-1001-F
A9R25	0757-0442		RESISTOR 10K $1\%$ .125W F TUBULAR	24546	C4-1/8-T0-1002-F
A9R26	0757-0438		RESISTOR 5.11K $1\%$ .125W F TUBULAR	24546	C4-1/8-T0-5111-F
A9R27	0757-0280		RESISTOR 1K $1\%$ .125W F TUBULAR	24546	C4-1/8-T0-1001-F
A9R28	0757-0442		RESISTOR 10K $1\%$ .125W F TUBULAR	24546	C4-1/8-T0-1002-F
A9R29	0757-0438		RESISTOR 5.11K $1\%$ .125W F TUBULAR	24546	C4-1/8-T0-5111-F
A9R30	0757-0280		RESISTOR 1K $1\%$ .125W F TUBULAR	24546	C4-1/8-T0-1001-F
A9R31	0757-0442		RESISTOR 10K $1\%$ .125W F TUBULAR	24546	C4-1/8-T0-1002-F
A9R32	0757-0438		RESISTOR 5.11K $1\%$ .125W F TUBULAR	24546	C4-1/8-T0-5111-F
A9R33	0757-0280		RESISTOR 1K $1\%$ .125W F TUBULAR	24546	C4-1/8-T0-1001-F
A9R34	0757-0442		RESISTOR 10K $1\%$ .125W F TUBULAR	24546	C4-1/8-T0-1002-F
A9R35	0757-0438		RESISTOR 5.11K $1\%$ .125W F TUBULAR	24546	C4-1/8-T0-5111-F

See introduction to this section for ordering information



Table 6-1. Parts List — Model 7132A (Continued)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A9S1	3101-0590	1	SWITCH, PUSHBUTTON, MULTI-STATION	28480	3101-0590
	5020-C495	1	PIN: SQUARE (TEST POINTS)	28480	5020-0495
A13	07130-61201	1	SERVO MODULE BOARD REMOTE PEN LIFT	28480	07130-61201
		1			
A13C1	0180-1819		CAPACITOR-FXD; 100UF+75-10% 50VDC AL	56289	300107G050DH2
A13CR1	1901-0033		DIODE-GEN PRP 180V 200MA	28480	1901-0033
A13Q1	1853-0012		TRANSISTOR PNP 2N2904A SI CHIP	01295	2N2904A
A13R1	0698-3629	1	RESISTOR 270 OHM 5% 2W HO TUBULAR	24546	FP42-2-T00-270R-J
A13R2	0757-C403	1	RESISTOR 121 OHM 1% .125W F TUBULAR	24546	C4-1/8-T0-121R-F
A13R3	0757-0280		RESISTOR 1K 1% .125W F TUBULAR	24546	C4-1/8-T0-1001-F

See introduction to this section for ordering information



Table 6-2. Parts List — Model 7133A

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A1	07131-60115	1	STANDARD MOTHER BOARD	28480	07131-60115
A1C1	0180-0334	2	CAPACITOR-FXD; 1200UF+75-10% 20VDC AL	56289	340128G020JJ4
A1C2	0180-0334		CAPACITOR-FXD; 1200UF+75-10% 20VDC AL	56289	340128G020JJ4
A1C5	0160-0174	1	CAPACITOR-FXD .47UF +80-20% 25WVDC CER	28480	0160-0174
A1C9	0180-2240	1	CAPACITOR-FXD; 2400UF+75-10% 25VDC AL	56289	390248G025JL2
A1C10	0160-3390	1	CAPACITOR-FXD .15UF +-10% 400WVDC MET	14752	X210B1E154K
A1C11	0180-2497	1	CAPACITOR-FXD; 3900UF+75-10% 75VDC AL	56289	360392G075B828
A1CR1	1901-0363	1	DIODE; MULT; FULL WAVE BRIDGE RECTIFIER	04713	SDA 10185-3
A1CR2	1901-0638	1	DIODE; MULT; FULL WAVE BRIDGE RECTIFIER	28480	1901-0638
A1CR5	1901-0159	2	DIODE-PWR RECT 400V 750MA	04713	SR1358-4
A1CR6	1901-0159		DIODE-PWR RECT 400V 750MA	04713	SR1358-4
A1CR7	1901-0418	2	DIODE-PWR RECT 400V 1.5A	04713	SR1846-12
A1CR8	1901-0418		DIODE-PWR RECT 400V 1.5A	04713	SR1846-12
A1F1	2110-0304	2	FUSE 1.5A 250V SLO-BLO	71400	MDX-1-1/2A
A1F2	2110-0304		FUSE 1.5A 250V SLO-BLO	71400	MDX-1-1/2A
A1F5	2110-0063	1	FUSE .75A 250V	71400	AGC-3/4
A1F6	2110-0043	1	FUSE 1.5A 250V	71400	AGC 1-1/2
A1J1	1251-1626	3	CONNECTOR; PC EDGE; 12-CONT; DIP SOLDER	71785	252-12-30-300
A1J3	1251-1626		CONNECTOR; PC EDGE; 12-CONT; DIP SOLDER	71785	252-12-30-300
A1J5	1251-2034	1	CONNECTOR; PC EDGE; 10-CONT; DIP SOLDER	71785	252-10-30-300
A1J7	1251-2026	1	CONNECTOR; PC EDGE; 18-CONT; DIP SOLDER	71785	252-18-30-300
A1J10	1251-1626		CONNECTOR; PC EDGE; 12-CONT; DIP SOLDER	71785	252-12-30-300
A1R1	0757-0833	2	RESISTOR 5.11K 1% .5W F TUBULAR	30983	MF7C1/2-T0-5111-F
A1R2	0757-0833		RESISTOR 5.11K 1% .5W F TUBULAR	30983	MF7C1/2-T0-5111-F
A1R5	0757-0984	1	RESISTOR 10 OHM 1% .5W F TUBULAR	30983	MF7C1/2-T0-10R0-F
A1R7	0757-0824	1	RESISTOR 2K 1% .5W F TUBULAR	30983	MF7C1/2-T0-2001-F
A1R8	0757-0839	1	RESISTOR 10K 1% .5W F TUBULAR	30983	MF7C1/2-T0-1002-F
A1R9	0812-0046	2	RESISTOR 2 OHM 5% 5W PW TUBULAR	91637	CW5-2-5W-T2-2R0-J
A1R10	0812-0046		RESISTOR 2 OHM 5% 5W PW TUBULAR	91637	CW5-2-5W-T2-2R0-J
A1XF1	2110-0269	4	FUSEHOLDER;	28480	2110-0269
A1Z	1400-0482		CLAMP; CABLE TIE; .14 W NYL	06383	PLT31-MP8
	1400-0482	2	CLAMP; CABLE TIE; .14 W NYL	06383	PLT31-MP8
	5020-0495	1	PIN:SQUARE(TEST POINTS)	28480	5020-0495

See introduction to this section for ordering information

Table 6-2. Parts List — Model 7133A (Continued)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A2	07130-60200	1	SERVO AMPLIFIER BOARD ASSY	28480	07130-60200
A2C1	0160-2199	2	CAPACITOR-FXD 30PF +-5% 300WVDC MICA	28480	0160-2199
A2C2	0160-2211	1	CAPACITOR-FXD 510PF +-5% 300WVDC MICA	28480	0160-2211
A2C3	0160-2204	6	CAPACITOR-FXD 100PF +-5% 300WVDC MICA	28480	0160-2204
A2C4	0180-0229	2	CAPACITOR-FXD; 33UF+-10% 10VDC TA-SOLID	56289	150D336X901082
A2C5	0180-0229		CAPACITOR-FXD; 33UF+-10% 10VDC TA-SOLID	56289	150D336X901082
A2C6	0160-3387	1	CAPACITOR-FXD .35UF +-10% 80WVDC POLYE	56289	292P3949R8
A2C7	0160-2204		CAPACITOR-FXD 100PF +-5% 300WVDC MICA	28480	0160-2204
A2C8	0160-2204		CAPACITOR-FXD 100PF +-5% 300WVDC MICA	28480	0160-2204
A2C9	0160-2204		CAPACITOR-FXD 100PF +-5% 300WVDC MICA	28480	0160-2204
A2C10	0160-0174	1	CAPACITOR-FXD .47UF +80-20% 25WVDC CER	28480	0160-0174
A2C11	0160-0859	2	CAPACITOR-FXD 1UF +-10% 50WVDC POLYE	56289	148P335-PUM
A2C12	0160-0297	1	CAPACITOR-FXD 1200PF +-10% 200WVDC POLYE	56289	292P12292
A2C13	0160-0859		CAPACITOR-FXD 1UF +-10% 50WVDC POLYE	56289	148P335-PUM
A2CR1	1902-3149	2	DIODE-ZNR 9.09V 5% DO-7 PD=.4W	04713	SZ 10939-170
A2CR2	1902-3149		DIODE-ZNR 9.09V 5% DO-7 PD=.4W	04713	SZ 10939-170
A2CR3	1901-0033	11	DIODE-GEN PRP 180V 200MA	28480	1901-0033
A2CR4	1901-0033		DIODE-GEN PRP 180V 200MA	28480	1901-0033
A2CR5	1901-0033		DIODE-GEN PRP 180V 200MA	28480	1901-0033
A2CR6	1901-0033		DIODE-GEN PRP 180V 200MA	28480	1901-0033
A2CR7	1901-0033		DIODE-GEN PRP 180V 200MA	28480	1901-0033
A2CR8	1901-0033		DIODE-GEN PRP 180V 200MA	28480	1901-0033
A2CR9	1901-0033		DIODE-GEN PRP 180V 200MA	28480	1901-0033
A2CR11	1901-0033		DIODE-GEN PRP 180V 200MA	28480	1901-0033
A2CR12	1901-0033		DIODE-GEN PRP 180V 200MA	28480	1901-0033
A2CR13	1901-0033		DIODE-GEN PRP 180V 200MA	28480	1901-0033
A2CR14	1901-0040	35	DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A2CR15	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A2CR16	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A2CR17	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A2CR18	1902-0777	2	DIODE; ZENER; 6.2V VZ; .25W MAX PD	04713	1N825
A2CR19	1902-0777		DIODE; ZENER; 6.2V VZ; .25W MAX PD	04713	1N825
A2IC1	1820-0223	10	IC LIN LM301AH AMPLIFIER	27014	LM301AH
A2IC2	1820-0223		IC LIN LM301AH AMPLIFIER	27014	LM301AH
A2IC3	1820-0223		IC LIN LM301AH AMPLIFIER	27014	LM301AH
A2IC4	1820-0223		IC LIN LM301AH AMPLIFIER	27014	LM301AH
A2IC5	1820-0223		IC LIN LM301AH AMPLIFIER	27014	LM301AH
A2IC6	1820-0223		IC LIN LM301AH AMPLIFIER	27014	LM301AH
A2R1	0698-0092	1	RESISTOR 2.61K 1% .125W F TUBULAR	03888	PME55-1/8-T0-2611-F
A2R2	0698-7879	1	RESISTOR 14.3K 1% .125W F TUBULAR	30983	MF4C1/8-T9-1435-F
A2R3	0811-2611	1	RESISTOR 17.4K 1% .25W PWM TUBULAR	14140	1250-1/4-0-1742
A2R4	2100-1757	1	RESISTOR-VAR TRMR 500 OHM 5% WW TOP ADJ	68027	CT-106-4
A2R5	0698-0085	1	RESISTOR 2.61K 1% .125W F TUBULAR	16299	C4-1/8-T0-2611-F
A2R6	0698-3158	1	RESISTOR 23.7K 1% .125W F TUBULAR	16299	C4-1/8-T0-2372-F
A2R7	0698-3162	4	RESISTOR 46.4K 1% .125W F TUBULAR	16299	C4-1/8-T0-4642-F
A2R8	0757-0280	9	RESISTOR 1K 1% .125W F TUBULAR	24546	C4-1/8-T0-1001-F
A2R9	0698-3449	2	RESISTOR 28.7K 1% .125W F TUBULAR	16299	C4-1/8-T0-2872-F
A2R10	0757-0416	3	RESISTOR 511 OHM 1% .125W F TUBULAR	24546	C4-1/8-T0-511R-F
A2R11	0698-3161	2	RESISTOR 38.3K 1% .125W F TUBULAR	16299	C4-1/8-T0-3832-F
A2R12	0757-0416		RESISTOR 511 OHM 1% .125W F TUBULAR	24546	C4-1/8-T0-511R-F
A2R13	0757-0815	2	RESISTOR 562 OHM 1% .5W F TUBULAR	30983	MF7C1/2-T0-562R-F
A2R14	0757-0815		RESISTOR 562 OHM 1% .5W F TUBULAR	30983	MF7C1/2-T0-562R-F
A2R15	0757-0465	7	RESISTOR 100K 1% .125W F TUBULAR	24546	C4-1/8-T0-1003-F
A2R16	2100-3350	2	RESISTOR-VAR TRMR 200 OHM 10% C SIDE ADJ	73138	72XR201
A2R17	0757-0284	2	RESISTOR 150 OHM 1% .125W F TUBULAR	24546	C4-1/8-T0-151-F
A2R18	0757-0443	1	RESISTOR 11K 1% .125W F TUBULAR	24546	C4-1/8-T0-1102-F
A2R19	2100-3350		RESISTOR-VAR TRMR 200 OHM 10% C SIDE ADJ	73138	72XR201
A2R20	0757-0284		RESISTOR 150 OHM 1% .125W F TUBULAR	24546	C4-1/8-T0-151-F
A2R21	0757-0465		RESISTOR 100K 1% .125W F TUBULAR	24546	C4-1/8-T0-1003-F
A2R22	0757-0401	5	RESISTOR 100 OHM 1% .125W F TUBULAR	24546	C4-1/8-T0-101-F
A2R23	0757-0199	1	RESISTOR 21.5K 1% .125W F TUBULAR	24546	C4-1/8-T0-2152-F
A2R24	0757-0439	6	RESISTOR 6.81K 1% .125W F TUBULAR	24546	C4-1/8-T0-6811-F
A2R26	0698-3157	3	RESISTOR 19.6K 1% .125W F TUBULAR	16299	C4-1/8-T0-1962-F
A2R28	0698-3157		RESISTOR 19.6K 1% .125W F TUBULAR	16299	C4-1/8-T0-1962-F
A2R31	0698-3161		RESISTOR 38.3K 1% .125W F TUBULAR	16299	C4-1/8-T0-3832-F
A2R33	0757-0401		RESISTOR 100 OHM 1% .125W F TUBULAR	24546	C4-1/8-T0-101-F
A2R34	0698-3457	3	RESISTOR 316K 1% .125W F TUBULAR	19701	MF4C1/8-T0-3163-F
A3	07130-60100	1	POWER SUPPLY BOARD ASSY	28480	07130-60100

See introduction to this section for ordering information

Table 6-2. Parts List — Model 7133A (Continued)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A3C1	0180-2493	2	CAPACITOR-FXD; 150UF+75-10% 50VDC AL	56289	390157G050EL4
A3C2	0180-0058	3	CAPACITOR-FXD; 50UF+75-10% 25VDC AL	56289	300506G025CC2
A3C3	0160-0153	2	CAPACITOR-FXD 1000PF +-10% 200WVDC POLYE	56289	292P10292
A3C4	0160-0153		CAPACITOR-FXD 1000PF +-10% 200WVDC POLYE	56289	292P10292
A3C5	0180-2493		CAPACITOR-FXD; 150UF+75-10% 50VDC AL	56289	390157G050EL4
A3C6	0180-0058		CAPACITOR-FXD; 50UF+75-10% 25VDC AL	56289	300506G025CC2
A3CR1	1901-0022	3	DIODE-STABISTOR 10V 250MA	28480	1901-0022
A3CR2	1902-0048	2	DIODE-ZNR 6.81V 5% DO-7 PD=.4W	28480	1902-0048
A3CR3	1901-0022		DIODE-STABISTOR 10V 250MA	28480	1901-0022
A3CR4	1902-0048		DIODE-ZNR 6.81V 5% DO-7 PD=.4W	28480	1902-0048
A3Q1	1855-0362	2	TRANSISTOR; J-FET P-CHAN, D-MODE SI	28480	1855-0362
A3Q2	1854-0087	7	TRANSISTOR NPN SI PD=360MW FT=75MHZ	28480	1854-0087
A3Q3	1854-0087		TRANSISTOR NPN SI PD=360MW FT=75MHZ	28480	1854-0087
A3Q4	1855-0362		TRANSISTOR; J-FET P-CHAN, D-MODE SI	28480	1855-0362
A3Q5	1853-0086	3	TRANSISTOR PNP SI CHIP PD=310MW	28480	1853-0086
A3Q6	1853-0086		TRANSISTOR PNP SI CHIP PD=310MW	28480	1853-0086
A3R1	0698-5525	2	RESISTOR 6.8 OHM 5% .5W CC TUBULAR	01121	EB68G5
A3R2	0698-3200	2	RESISTOR 8K 1% .125W F TUBULAR	16299	C4-1/8-T0-8001-F
A3R3	0757-0288	2	RESISTOR 9.09K 1% .125W F TUBULAR	30983	MF4C1/8-T0-9091-F
A3R4	0757-0346	2	RESISTOR 10 OHM 1% .125W F TUBULAR	24546	C4-1/8-T0-10R0-F
A3R5	0757-0346		RESISTOR 10 OHM 1% .125W F TUBULAR	24546	C4-1/8-T0-10R0-F
A3R6	0757-0288		RESISTOR 9.09K 1% .125W F TUBULAR	30983	MF4C1/8-T0-9091-F
A3R7	0698-5525		RESISTOR 6.8 OHM 5% .5W CC TUBULAR	01121	EB68G5
A3R8	0698-3200		RESISTOR 8K 1% .125W F TUBULAR	16299	C4-1/8-T0-8001-F
A4	07130-61310	1	PREAMPLIFIER BOARD ASSY	28480	07130-61310
A4C1	0150-0121	2	CAPACITOR-FXD .1UF +80-20% 50WVDC CER	28480	0150-0121
A4C2	0150-0121		CAPACITOR-FXD .1UF +80-20% 50WVDC CER	28480	0150-0121
A4C3	0160-0205	2	CAPACITOR-FXD 10PF +-5% 500WVDC MICA 0+	28480	0160-0205
A4C4	0160-0205		CAPACITOR-FXD 10PF +-5% 500WVDC MICA 0+	28480	0160-0205
A4C5	0160-3532	2	CAPACITOR-FXD .056UF +-2% 200WVDC MET	28480	0160-3532
A4C6	0180-0195	1	CAPACITOR-FXD; .33UF+-20% 35VDC TA	56289	1500334X0035A2
A4C7	0160-3532		CAPACITOR-FXD .056UF +-2% 200WVDC MET	28480	0160-3532
A4C8	0160-0168	4	CAPACITOR-FXD .1UF +-10% 200WVDC POLYE	56289	292P10492
A4C9	0180-0197	5	CAPACITOR-FXD; 2.2UF+-10% 20VDC TA	56289	1500225X9020A2
A4C10	0180-0291	2	CAPACITOR-FXD; 1UF+-10% 35VDC TA-SGLID	56289	1500105X9035A2
A4C11	0180-0116	1	CAPACITOR-FXD; 6.8UF+-10% 35VDC TA	56289	1500685X9035B2
A4C12	0180-0058		CAPACITOR-FXD; 50UF+75-10% 25VDC AL	56289	300506G025CC2
A4C13	0180-0197		CAPACITOR-FXD; 2.2UF+-10% 20VDC TA	56289	1500225X9020A2
A4C14	0180-0106	1	CAPACITOR-FXD; 60UF+-20% 6VDC TA-SGLID	56289	1500606X0006B2
A4C15	0160-2199		CAPACITOR-FXD 30PF +-5% 300WVDC MICA	28480	0160-2199
A4C16	0180-0197		CAPACITOR-FXD; 2.2UF+-10% 20VDC TA	56289	1500225X9020A2
A4C17	0180-0197		CAPACITOR-FXD; 2.2UF+-10% 20VDC TA	56289	1500225X9020A2
A4C18	0160-2204		CAPACITOR-FXD 100PF +-5% 300WVDC MICA	28480	0160-2204
A4C19	0160-3518	1	CAPACITOR-FXD 1UF +-5% 100WVDC MET POLYE	84411	MEW 186
A4C20	0160-2204		CAPACITOR-FXD 100PF +-5% 300WVDC MICA	28480	0160-2204
A4CR1	1902-0049	2	DIODE-ZNR 6.19V 5% DO-7 PD=.4W	28480	1902-0049
A4CR2	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A4CR3	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A4CR4	1902-0049		DIODE-ZNR 6.19V 5% DO-7 PD=.4W	28480	1902-0049
A4CR5	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A4CR6	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A4CR7	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A4CR8	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A4CR9	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A4CR10	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A4CR11	1990-0411	2	PHOTO-DEVICE; SW PNP-SI 3V .05MW PD	04713	MLED50
A4CR12	1990-0411		PHOTO-DEVICE; SW PNP-SI 3V .05MW PD	04713	MLED50
A4CR13	1902-0025	2	DIODE-ZNR 10V 5% DO-7 PD=.4W TC=+.06%	04713	SZ 10939-182
A4CR14	1902-0025		DIODE-ZNR 10V 5% DO-7 PD=.4W TC=+.06%	04713	SZ 10939-182
A4CR15	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A4CR16	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A4CR17	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A4CR18	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A4IC1	1820-0223		IC LIN LM301AH AMPLIFIER	27014	LM301AH
A4IC2	1820-0223		IC LIN LM301AH AMPLIFIER	27014	LM301AH
A4IC3	1820-0223		IC LIN LM301AH AMPLIFIER	27014	LM301AH
A4Q1	1853-0012	3	TRANSISTOR PNP 2N2904A SI CHIP	01295	2N2904A
A4Q2	1854-0087		TRANSISTOR NPN SI PD=360MW FT=75MHZ	28480	1854-0087
A4Q3	1854-0087		TRANSISTOR NPN SI PD=360MW FT=75MHZ	28480	1854-0087
A4Q4	1853-0012		TRANSISTOR PNP 2N2904A SI CHIP	01295	2N2904A
A4Q5	1854-0087		TRANSISTOR NPN SI PD=360MW FT=75MHZ	28480	1854-0087

See introduction to this section for ordering information



Table 6-2. Parts List — Model 7133A (Continued)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A4Q6	1854-0087	1	TRANSISTOR NPN SI PD=360MW FT=75MHZ	28480	1854-0087
A4Q7	5081-5004		TRANSISTOR, SELECTED 1855-0351	28480	5081-5004
A4Q8	1853-0086		TRANSISTOR PNP SI CHIP PD=310MW	28480	1853-0086
A4Q5	1855-0062		TRANSISTOR; J-FET N-CHAN, D-MODE SI	28480	1855-0062
A4Q10	1855-0062		TRANSISTOR; J-FET N-CHAN, D-MODE SI	28480	1855-0062
A4R1	0757-0465	2	RESISTOR 100K 1% .125W F TUBULAR	24546	C4-1/8-T0-1003-F
A4R2	0698-3399		RESISTOR 133 OHM 1% .5W F TUBULAR	19701	MF7C1/2-T0-133R-F
A4R3	0757-0469		RESISTOR 150K 1% .125W F TUBULAR	24546	C4-1/8-T0-1503-F
A4R4	0757-0283		RESISTOR 2K 1% .125W F TUBULAR	24546	C4-1/8-T0-2001-F
A4R5	0757-0469		RESISTOR 150K 1% .125W F TUBULAR	24546	C4-1/8-T0-1503-F
A4R6	0757-0469	3	RESISTOR 150K 1% .125W F TUBULAR	24546	C4-1/8-T0-1503-F
A4R7	0757-0283		RESISTOR 2K 1% .125W F TUBULAR	24546	C4-1/8-T0-2001-F
A4R8	0698-3260		RESISTOR 464K 1% .125W F TUBULAR	19701	MF4C1/8-T0-4643-F
A4R9	0698-3260		RESISTOR 464K 1% .125W F TUBULAR	19701	MF4C1/8-T0-4643-F
A4R10	0698-3399		RESISTOR 133 OHM 1% .5W F TUBULAR	19701	MF7C1/2-T0-133R-F
A4R11	0757-0465	2	RESISTOR 100K 1% .125W F TUBULAR	24546	C4-1/8-T0-1003-F
A4R12	0757-0469		RESISTOR 150K 1% .125W F TUBULAR	24546	C4-1/8-T0-1503-F
A4R13	0757-0459		RESISTOR 56.2K 1% .125W F TUBULAR	24546	C4-1/8-T0-5622-F
A4R14	0757-0465		RESISTOR 100K 1% .125W F TUBULAR	24546	C4-1/8-T0-1003-F
A4R15	0757-0465		RESISTOR 100K 1% .125W F TUBULAR	24546	C4-1/8-T0-1003-F
A4R16	0757-0442	14	RESISTOR 10K 1% .125W F TUBULAR	24546	C4-1/8-T0-1002-F
A4R17	0757-0442		RESISTOR 10K 1% .125W F TUBULAR	24546	C4-1/8-T0-1002-F
A4R18	0757-0442		RESISTOR 10K 1% .125W F TUBULAR	24546	C4-1/8-T0-1002-F
A4R19	0757-0442		RESISTOR 10K 1% .125W F TUBULAR	24546	C4-1/8-T0-1002-F
A4R20	0757-0459		RESISTOR 56.2K 1% .125W F TUBULAR	24546	C4-1/8-T0-5622-F
A4R21	0757-0440	1	RESISTOR 7.5K 1% .125W F TUBULAR	24546	C4-1/8-T0-7501-F
A4R22	0698-3162		RESISTOR 46.4K 1% .125W F TUBULAR	16299	C4-1/8-T0-4642-F
A4R23	0698-3162		RESISTOR 46.4K 1% .125W F TUBULAR	16299	C4-1/8-T0-4642-F
A4R24	0757-0449		RESISTOR 20K 1% .125W F TUBULAR	24546	C4-1/8-T0-2002-F
A4R25	0698-3438		RESISTOR 147 OHM 1% .125W F TUBULAR	16299	C4-1/8-T0-147R-F
A4R26	0698-3162	8	RESISTOR 46.4K 1% .125W F TUBULAR	16299	C4-1/8-T0-4642-F
A4R27	0698-3260		RESISTOR 464K 1% .125W F TUBULAR	19701	MF4C1/8-T0-4643-F
A4R28	0757-0438		RESISTOR 5.11K 1% .125W F TUBULAR	24546	C4-1/8-T0-5111-F
A4R29	0757-0280		RESISTOR 1K 1% .125W F TUBULAR	24546	C4-1/8-T0-1001-F
A4R30	0757-0283		RESISTOR 2K 1% .125W F TUBULAR	24546	C4-1/8-T0-2001-F
A4R31	0757-0442	1	RESISTOR 10K 1% .125W F TUBULAR	24546	C4-1/8-T0-1002-F
A4R32	2100-2633		RESISTOR; VAR; TRMR; 1KOHM 10% C	19701	ET50X102
A4R33	0683-7545		RESISTOR 750K 5% .25W CC TUBULAR	01121	CB7545
A4R34	0686-1065		RESISTOR 10M 5% .5W CC TUBULAR	01121	EB1065
A4R35	0686-1065		RESISTOR 10M 5% .5W CC TUBULAR	01121	EB1065
A4R36	0757-0442	1	RESISTOR 10K 1% .125W F TUBULAR	24546	C4-1/8-T0-1002-F
A4R37	0757-0442		RESISTOR 10K 1% .125W F TUBULAR	24546	C4-1/8-T0-1002-F
A4R38	0757-0442		RESISTOR 10K 1% .125W F TUBULAR	24546	C4-1/8-T0-1002-F
A4R40	0698-3457		RESISTOR 316K 1% .125W F TUBULAR	19701	MF4C1/8-T0-3163-F
A4R41	0698-3457		RESISTOR 316K 1% .125W F TUBULAR	19701	MF4C1/8-T0-3163-F
A4	07130-61410	1	CHOPPER BOARD ASSY	28480	07130-61410
A4 C21	0160-0168		CAPACITOR-FXD .1UF +-10% 200WVDC POLYE	56289	292P10492
A4 R42	1990-0305	2	PHOTO-CELL:5K/100 MEGOHM 50%	28480	1990-0305
A4 R43	1990-0305		PHOTO-CELL:5K/100 MEGOHM 50%	28480	1990-0305
A4 R44	0683-1035	1	RESISTOR 10K 5% .25W CC TUBULAR	01121	CB1035
A4S1	07130-61315	1	SWITCH-RANGE ASSY	28480	07130-61315
A4S1	3100-3297	1	SWITCH, ROTARY	28480	3100-3297
A4S1R11	0698-6305	1	RESISTOR 900K .1% .25W F TUBULAR	19701	MF52C1/4-T9-9003-B
A4S1R12	0683-9135	3	RESISTOR 91K 5% .25W CC TUBULAR	01121	CB9135
A4S1R13	0698-6342	1	RESISTOR 90K .1% .125W F TUBULAR	19701	MF4C1/8-T9-9002-B
A4S1R14	0683-8235	1	RESISTOR 82K 5% .25W CC TUBULAR	01121	CB8235
A4S1R15	0698-6343	1	RESISTOR 9K .1% .125W F TUBULAR	19701	MF4C1/8-T9-9001-B
A4S1R16	0683-9135	1	RESISTOR 91K 5% .25W CC TUBULAR	01121	CB9135
A4S1R17	0698-6344		RESISTOR 900 OHM .1% .125W F TUBULAR	19701	MF4C1/8-T9-900R-B
A4S1R18	0683-9135		RESISTOR 91K 5% .25W CC TUBULAR	01121	CB9135
A4S1R19	0698-6323	1	RESISTOR 100 OHM .1% .125W F TUBULAR	19701	MF4C1/8-T9-100R-B
A4S1R20	0698-6362	1	RESISTOR 1K .1% .125W F TUBULAR	19701	MF4C1/8-T9-1001-B
A4S1R21	0698-6322	1	RESISTOR 4K .1% .125W F TUBULAR	19701	MF4C1/8-T9-4001-B
A4S1R22	0698-6320	1	RESISTOR 5K .1% .125W F TUBULAR	03888	PME55-1/8-T9-5001-B
A4S1R23	0698-6363	1	RESISTOR 40K .1% .125W F TUBULAR	19701	MF4C1/8-T9-4002-B
A4S1R25	0757-0200	1	RESISTOR 5.62K 1% .125W F TUBULAR	24546	C4-1/8-T0-5621-F
A4S1R26	0757-0274	1	RESISTOR 1.21K 1% .125W F TUBULAR	24546	C4-1/8-T0-1213-F
A4S1R27	0757-0416	2	RESISTOR 511 OHM 1% .125W F TUBULAR	24546	C4-1/8-T0-511R-F
A4S1R28	0757-0420		RESISTOR 750 OHM 1% .125W F TUBULAR	24546	C4-1/8-T0-751-F
A4S1R29	0698-5672	1	RESISTOR 2.7K 1% .125W F TUBULAR	19701	MF4C1/8-T9-2701-F
A4S1R30	2100-3393	1	RESISTOR, VAR W/SW. 50K 10% LIN	28480	2100-3393
A4S1R31	0757-0261	1	RESISTOR 953K 1% .5W F TUBULAR	30983	MF7C1/2-T9-9533-F
A4S1Z	2190-0027	1	WASHER-LK INTL T NC. 1/4 .256 IN D	73189	1914-00
A4S2	2950-0043	1	NUT-HEX-DBL CHAM 3/8-32-THD .094-THK	73743	2X 28230
	2100-3393	1	SWITCH, PART OF 2100-3393(R-V)	28480	2100-3393

See introduction to this section for ordering information

Table 6-2. Parts List — Model 7133A (Continued)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A7	07130-60830	1	STANDARD FRAME OPTIONS BOARD	28480	07130-60830
A7C1	0160-0168	2	CAPACITOR-FXD .1UF +-10% 200WVDC POLYE	56289	292P10492
A7C2	0180-1819		CAPACITOR-FXD; 100UF+75-10% 50VDC AL	56289	300107G050DH2
A7C3	0160-0168	1	CAPACITOR-FXD .1UF +-10% 200WVDC POLYE	56289	292P10492
A7C4	0180-0137		CAPACITOR-FXD; 100UF+-20% 10VDC TA	56289	150D107X0010R2
A7CR1	1901-0040	1	DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR2	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR3	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR4	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR5	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR6	1901-0040	1	DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR7	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR8	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR9	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR10	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR11	1901-0040	1	DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR12	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR13	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR14	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR15	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR16	1902-3071	2	DIODE-ZNR 4.22V 2% DO-7 PD=.4W TC=	04713	SZ 10939-75
A7CR17	1901-0022		DIODE-STABISTOR 10V 250MA	28480	1901-0022
A7CR18	1902-0078	1	DIODE-ZNR 14.7V 2% DO-7 PD=.4W	28480	1902-0078
A7CR19	1902-3071		DIODE-ZNR 4.22V 2% DO-7 PD=.4W TC=	04713	SZ 10939-75
A7CR20	1901-0040	1	DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR21	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR22	1901-0040		DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7CR23	1901-0040	1	DIODE-SWITCHING 2NS 30V 50MA	28480	1901-0040
A7K1	0490-1088		RELAY; 24VDC; CONT 1A 28VDC FORM 2C	28480	0490-1088
A7Q1	1854-0071	8	TRANSISTOR NPN SI PD=300MW FT=200MHZ	28480	1854-0071
A7Q2	1854-0039		TRANSISTOR NPN 2N3053 SI PD=1W	04713	2N3053
A7Q3	1854-0039		TRANSISTOR NPN 2N3053 SI PD=1W	04713	2N3053
A7Q4	1854-0039		TRANSISTOR NPN 2N3053 SI PD=1W	04713	2N3053
A7Q5	1854-0071		TRANSISTOR NPN SI PD=300MW FT=200MHZ	28480	1854-0071
A7Q6	1854-0039	1	TRANSISTOR NPN 2N3053 SI PD=1W	04713	2N3053
A7Q7	1854-0086		TRANSISTOR NPN SI TO-3 PD=75W FT=6MHZ	28480	1854-0086
A7Q8	1854-0039		TRANSISTOR NPN 2N3053 SI PD=1W	04713	2N3053
A7Q9	1854-0067		TRANSISTOR NPN SI PD=360MW FT=75MHZ	28480	1854-0087
A7Q10	1854-0039		TRANSISTOR NPN 2N3053 SI PD=1W	04713	2N3053
A7Q11	1854-0071	1	TRANSISTOR NPN SI PD=300MW FT=200MHZ	28480	1854-0071
A7Q12	1854-0071		TRANSISTOR NPN SI PD=300MW FT=200MHZ	28480	1854-0071
A7Q13	1854-0039		TRANSISTOR NPN 2N3053 SI PD=1W	04713	2N3053
A7R1	0757-0442	1	RESISTOR 10K 1% .125W F TUBULAR	24546	C4-1/8-T0-1002-F
A7R2	0698-3637		RESISTOR 820 OHM 5% 3W MO TUBULAR	24546	FP42-2-T00-820R-J
A7R3	0757-0439		RESISTOR 6.81K 1% .125W F TUBULAR	24546	C4-1/8-T0-6811-F
A7R4	0757-0449		RESISTOR 20K 1% .125W F TUBULAR	24546	C4-1/8-T0-2002-F
A7R5	0757-0439		RESISTOR 6.81K 1% .125W F TUBULAR	24546	C4-1/8-T0-6811-F
A7R6	0757-0449	2	RESISTOR 20K 1% .125W F TUBULAR	24546	C4-1/8-T0-2002-F
A7R7	0757-0439		RESISTOR 6.81K 1% .125W F TUBULAR	24546	C4-1/8-T0-6811-F
A7R8	0757-0449		RESISTOR 20K 1% .125W F TUBULAR	24546	C4-1/8-T0-2002-F
A7R9	0698-3410		RESISTOR 3.16K 1% .5W F TUBULAR	19701	MF7C1/2-T0-3161-F
A7R10	0757-0439		RESISTOR 6.81K 1% .125W F TUBULAR	24546	C4-1/8-T0-6811-F
A7R11	0757-0795	1	RESISTOR 75 OHM 1% .5W F TUBULAR	30983	MF-1/2-T0-75R0-F
A7R12	0757-0420		RESISTOR 750 OHM 1% .125W F TUBULAR	24546	C4-1/8-T0-751-F
A7R13	0757-0839	1	RESISTOR 10K 1% .5W F TUBULAR	30983	MF7C1/2-T0-1002-F
A7R14	0757-0401		RESISTOR 100 OHM 1% .125W F TUBULAR	24546	C4-1/8-T0-101-F
A7R15	0698-3136	1	RESISTOR 17.8K 1% .125W F TUBULAR	16299	C4-1/8-T0-1782-F
A7R16	0698-3157	1	RESISTOR 19.6K 1% .125W F TUBULAR	16299	C4-1/8-T0-1962-F
A7R17	0757-0984		RESISTOR 10 OHM 1% .5W F TUBULAR	30983	MF7C1/2-T0-10R0-F
A7R18	0757-0438	1	RESISTOR 5.11K 1% .125W F TUBULAR	24546	C4-1/8-T0-5111-F
A7R19	0698-3406		RESISTOR 1.33K 1% .5W F TUBULAR	19701	MF7C1/2-T0-1331-F
A7R20	0757-0401	1	RESISTOR 100 OHM 1% .125W F TUBULAR	24546	C4-1/8-T0-101-F
A7R21	0757-0449		RESISTOR 20K 1% .125W F TUBULAR	24546	C4-1/8-T0-2002-F
A7R22	0698-3410		RESISTOR 3.16K 1% .5W F TUBULAR	19701	MF7C1/2-T0-3161-F
A7R23	0757-0439	1	RESISTOR 6.81K 1% .125W F TUBULAR	24546	C4-1/8-T0-6811-F
A9	07130-60700	1	STEPPER CHART DRIVE BOARD ASSY(8-SPEED)	28480	07130-60700
A9C1	0180-0291	1	CAPACITOR-FXD; 1UF+-10% 35VDC TA-SOLID	56289	150D105X9035A2
A9C2	0180-1743		CAPACITOR-FXD; .1UF+-10% 35VDC TA-SOLID	56289	150D104X9035A2
A9C3	0180-0197	2	CAPACITOR-FXD; 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A9C4	0180-1745		CAPACITOR-FXD; 1.5UF+-10% 20VDC TA	56289	150D155X9020A2
A9C5	0180-1745		CAPACITOR-FXD; 1.5UF+-10% 20VDC TA	56289	150D155X9020A2

See introduction to this section for ordering information



Table 6-2. Parts List — Model 7133A (Continued)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A9C6	0160-2215	1	CAPACITOR-FXD 750PF $\pm 5\%$ 300WVDC MICA	28480	0160-2215
A9C7	0150-0093	2	CAPACITOR-FXD .01UF $\pm 80-20\%$ 100WVDC CER	28480	0150-0093
A9C8	0150-0093		CAPACITOR-FXD .01UF $\pm 80-20\%$ 100WVDC CER	28460	0150-0093
A9C9	0180-0374	1	CAPACITOR-FXD; 10UF $\pm 10\%$ 20VDC TA-SULID	56289	150D106X9020B2
A9CR1	1901-0050	2	DIODE-SWITCHING 2NS 80V 200MA	28480	1901-0050
A9CR2	1901-0050		DIODE-SWITCHING 2NS 80V 200MA	28480	1901-0050
A9CR3	1901-0158	5	DIODE-PWR RECT 200V 750MA	04713	SR1358-3
A9CR4	1901-0025	8	DIODE-GEN PRP 100V 200MA	28480	1901-0025
A9CR5	1901-0025		DIODE-GEN PRP 100V 200MA	28480	1901-0025
A9CR6	1901-0158		DIODE-PWR RECT 200V 750MA	04713	SR1358-3
A9CR7	1901-0025		DIODE-GEN PRP 100V 200MA	28480	1901-0025
A9CR8	1901-0025		DIODE-GEN PRP 100V 200MA	28480	1901-0025
A9CR9	1901-0158		DIODE-PWR RECT 200V 750MA	04713	SR1358-3
A9CR10	1901-0025		DIODE-GEN PRP 100V 200MA	28480	1901-0025
A9CR11	1901-0025		DIODE-GEN PRP 100V 200MA	28480	1901-0025
A9CR12	1901-0158		DIODE-PWR RECT 200V 750MA	04713	SR1358-3
A9CR13	1901-0025		DIODE-GEN PRP 100V 200MA	28480	1901-0025
A9CR14	1901-0025		DIODE-GEN PRP 100V 200MA	28480	1901-0025
A9CR15	1901-0158		DIODE-PWR RECT 200V 750MA	04713	SR1358-3
A9CR16	1902-3208	1	DIODE-ZNR 15.4V 5% DO-7 PD=.4W TC= $\pm .06\%$	04713	SZ 10939-236
A9IC1	1820-0223		IC LIN LM301AH AMPLIFIER	27014	LM301AH
A9IC2	1820-0630	1	IC DGTLMISCELLANECUS (DIGITAL)	04713	MC4044P
A9IC3	1820-0567	1	IC DGTLMC 4024P MULTIVIBRATOR	04713	MC4024P
A9IC4	1820-0056	2	IC DGTLSN74 92 N COUNTER	01295	SN7492N
A9IC5	1820-0056		IC DGTLSN74 92 N COUNTER	01295	SN7492N
A9IC6	1820-0055	1	IC DGTLSN74 90 N COUNTER	01295	SN7490N
A9IC8	1820-0075	1	IC DGTLMFLIP-FLOP	01295	SN7473N
A9Q1	1854-0071		TRANSISTOR NPN SI PD=300MW FT=270MHZ	28480	1854-0071
A9Q2	1855-0062		TRANSISTOR J-FET N-CHAN, D-MODE SI	28480	1855-0062
A9Q3	1854-0071		TRANSISTOR NPN SI PD=300MW FT=200MHZ	28480	1854-0071
A9Q4	1854-0071		TRANSISTOR NPN SI PD=300MW FT=200MHZ	28480	1854-0071
A9Q5	1854-0071		TRANSISTOR NPN SI PD=300MW FT=200MHZ	28480	1854-0071
A9Q6	1854-0215	4	TRANSISTOR NPN SI PD=310MW FT=300MHZ	04713	SPS 3611
A9Q7	1854-0039		TRANSISTOR NPN 2N3053 SI PD=1W	04713	2N3053
A9Q8	1854-0215		TRANSISTOR NPN SI PD=310MW FT=300MHZ	04713	SPS 3611
A9Q9	1854-0039		TRANSISTOR NPN 2N3053 SI PD=1W	04713	2N3053
A9Q10	1854-0215		TRANSISTOR NPN SI PD=310MW FT=300MHZ	04713	SPS 3611
A9Q11	1854-0039		TRANSISTOR NPN 2N3053 SI PD=1W	04713	2N3053
A9Q12	1854-0215		TRANSISTOR NPN SI PD=310MW FT=300MHZ	04713	SPS 3611
A9Q13	1854-0039		TRANSISTOR NPN 2N3053 SI PD=1W	04713	2N3053
A9Q14	1854-0441	1	TRANSISTOR NPN SI PD=5.8W FT=800KHZ	28480	1854-0441
A9R1	0757-0461	2	RESISTOR 68.1K 1% .125W F TUBULAR	24546	C4-1/8-T0-6812-F
A9R2	0698-3152	3	RESISTOR 3.48K 1% .125W F TUBULAR	16299	C4-1/8-T0-3481-F
A9R3	0698-3152		RESISTOR 3.48K 1% .125W F TUBULAR	16299	C4-1/8-T0-3481-F
A9R4	0757-0465		RESISTOR 100K 1% .125W F TUBULAR	24546	C4-1/8-T0-1003-F
A9R5	0757-0283		RESISTOR 2K 1% .125W F TUBULAR	24546	C4-1/8-T0-2001-F
A9R6	0757-0442		RESISTOR 10K 1% .125W F TUBULAR	24546	C4-1/8-T0-1002-F
A9R7	0698-3449		RESISTOR 28.7K 1% .125W F TUBULAR	16299	C4-1/8-T0-2872-F
A9R8	0757-1094	1	RESISTOR 1.47K 1% .125W F TUBULAR	24546	C4-1/8-T0-1471-F
A9R9	0757-0438		RESISTOR 5.11K 1% .125W F TUBULAR	24546	C4-1/8-T0-5111-F
A9R10	0757-0472	2	RESISTOR 200K 1% .125W F TUBULAR	24546	C4-1/8-T0-2003-F
A9R11	0757-0472		RESISTOR 200K 1% .125W F TUBULAR	24546	C4-1/8-T0-2003-F
A9R12	0757-0401		RESISTOR 100 OHM 1% .125W F TUBULAR	24546	C4-1/8-T0-101-F
A9R13	2100-1788	1	RESISTOR; VAR; TRMR; 500 OHM 10% C	30983	ET50W501
A9R14	0757-0461		RESISTOR 68.1K 1% .125W F TUBULAR	24546	C4-1/8-T0-6812-F
A9R15	0757-0819	1	RESISTOR 909 OHM 1% .5W F TUBULAR	30983	MF7C1/2-T0-909R-F
A9R15	0757-0280		RESISTOR 1K 1% .125W F TUBULAR	24546	C4-1/8-T0-1001-F
A9R16	0757-0290	1	RESISTOR 6.19K 1% .125W F TUBULAR	30983	MF4C1/8-T0-6191-F
A9R17	0757-0458	1	RESISTOR 51.1K 1% .125W F TUBULAR	24546	C4-1/8-T0-5112-F
A9R18	0698-3152		RESISTOR 3.48K 1% .125W F TUBULAR	16299	C4-1/8-T0-3481-F
A9R19	0698-0084	1	RESISTOR 2.15K 1% .125W F TUBULAR	16299	C4-1/8-T0-2151-F
A9R20	0698-3447	1	RESISTOR 422 OHM 1% .125W F TUBULAR	16299	C4-1/8-T0-422R-F
A9R21	0698-3446	1	RESISTOR 383 OHM 1% .125W F TUBULAR	16299	C4-1/8-T0-383R-F
A9R22	0757-0438		RESISTOR 5.11K 1% .125W F TUBULAR	24546	C4-1/8-T0-5111-F
A9R23	0757-0280		RESISTOR 1K 1% .125W F TUBULAR	24546	C4-1/8-T0-1001-F
A9R24	0757-0280		RESISTOR 1K 1% .125W F TUBULAR	24546	C4-1/8-T0-1001-F
A9R25	0757-0442		RESISTOR 10K 1% .125W F TUBULAR	24546	C4-1/8-T0-1002-F
A9R26	0757-0438		RESISTOR 5.11K 1% .125W F TUBULAR	24546	C4-1/8-T0-5111-F
A9R27	0757-0280		RESISTOR 1K 1% .125W F TUBULAR	24546	C4-1/8-T0-1001-F
A9R28	0757-0442		RESISTOR 10K 1% .125W F TUBULAR	24546	C4-1/8-T0-1002-F
A9R29	0757-0438		RESISTOR 5.11K 1% .125W F TUBULAR	24546	C4-1/8-T0-5111-F
A9R30	0757-0280		RESISTOR 1K 1% .125W F TUBULAR	24546	C4-1/8-T0-1001-F
A9R31	0757-0442		RESISTOR 10K 1% .125W F TUBULAR	24546	C4-1/8-T0-1002-F
A9R32	0757-0438		RESISTOR 5.11K 1% .125W F TUBULAR	24546	C4-1/8-T0-5111-F
A9R33	0757-0280		RESISTOR 1K 1% .125W F TUBULAR	24546	C4-1/8-T0-1001-F
A9R34	0757-0442		RESISTOR 10K 1% .125W F TUBULAR	24546	C4-1/8-T0-1002-F
A9R35	0757-0438		RESISTOR 5.11K 1% .125W F TUBULAR	24546	C4-1/8-T0-5111-F

See introduction to this section for ordering information



Table 6-2. Parts List — Model 7133A (Continued)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A9S1	3101-0590	1	SWITCH, PUSHBUTTON, MULTI-STATION	28480	3101-0590
	5020-0495	1	PIN: SQUARE (TEST POINTS)	28480	5020-0495
A13	07130-61201	1	SERVO MODULE BOARD	28480	07130-61201
		1	REMOTE PEN LIFT		
A13C1	0180-1819		CAPACITOR-FXD; 100UF+75-10% 50VDC AL	56289	300107G0500H2
A13CR1	1901-0033		DIODE-GEN PRP 180V 200MA	28480	1901-0033
A13Q1	1853-0012		TRANSISTOR PNP 2N2904A SI CHIP	01295	2N2904A
A13R1	0698-3629	1	RESISTOR 270 OHM 5% 2W MO TUBULAR	24546	FP42-2-T00-270R-J
A13R2	0757-0403	1	RESISTOR 121 OHM 1% .125W F TUBULAR	24546	C4-1/8-T0-121R-F
A13R3	0757-0280		RESISTOR 1K 1% .125W F TUBULAR	24546	C4-1/8-T0-1001-F

See introduction to this section for ordering information

Table 6-3. Miscellaneous Parts – Models 7132A and 7133A

HP PART NO.	DESCRIPTION	MANUFACTURER	QTY
ACCESSORY KIT – PART NO. 07130-65320			
2110-0379	Fuse, 0.75A, 250V, SB	Bussman Mfg.	1
1540-0149	Plastic Box	Hewlett-Packard	1
5080-3635	Slidewire Lubricant	Hewlett-Packard	1
5080-3605	Slidewire Cleaner	Hewlett-Packard	1
07130-62500	Disposable Pens – Blue (Package of 3)	Hewlett-Packard	1
07130-62510	Disposable Pens – Red (Package of 3)	Hewlett-Packard	1
17999-09423	Syringe (Modified)	Hewlett-Packard	1
07130-65300	Pen Tip Assembly	Hewlett-Packard	1
0890-0351	Tubing, Flexible, 0.050 ID x 0.4 ft	Graphic Control	1
0890-1087	Tubing, Flexible, 0.06 ID x 0.3 ft	Graphic Control	1
EVENT MARKER INK SUPPLIES (MAY BE ORDERED)			
5060-6506	Ink Cartridge, Red	Hewlett-Packard	1
5060-6505	Ink Cartridge, Blue	Hewlett-Packard	1
07130-60002	Ink Cartridge, Black	Hewlett-Packard	1
0890-0584	Tubing – Cartridge to Reservoir	Hewlett-Packard	
0890-1087	Tubing – Primer to Cartridge	Hewlett-Packard	
GRAPH PAPER – ENGLISH AND METRIC			
9280-0264	Chart Paper – English	Hewlett-Packard	
9280-0265	Chart Paper – Metric	Hewlett-Packard	
SCALE – MARKED – ENGLISH AND METRIC (7132A)			
07130-02110	Scale, Upper – English	Hewlett-Packard	
07130-02120	Scale, Lower – English	Hewlett-Packard	
07130-02150	Scale, Upper – RH Zero – English (Opt 014)	Hewlett-Packard	
07130-02160	Scale, Lower – RH Zero – English (Opt 014)	Hewlett-Packard	
07130-02190	Scale, Upper – Metric (Opt 001)	Hewlett-Packard	
07130-02195	Scale, Lower – Metric (Opt 001)	Hewlett-Packard	
07130-02270	Scale, Upper – RH Zero – Metric (Opt 001, Opt 014)	Hewlett-Packard	
07130-02280	Scale, Lower – RH Zero – Metric (Opt 001)	Hewlett-Packard	
SCALE – MARKED – ENGLISH AND METRIC (7133A)			
07130-02110	Scale, Upper – English	Hewlett-Packard	
07130-02150	Scale, Upper – RH Zero – English (Opt 014)	Hewlett-Packard	
07130-02190	Scale, Upper – Metric (Opt 001)	Hewlett-Packard	
07130-02270	Scale, Upper – RH Zero – Metric (Opt 001, Opt 014)	Hewlett-Packard	
EXTENDER BOARD			
07130-69000	Servo/Frame Options	Hewlett-Packard	
07130-69001	Channel Options	Hewlett-Packard	
07130-69002	Preamplifier	Hewlett-Packard	
RACK MOUNTING BRACKETS			
07130-65070	Ear Rack Assembly	Hewlett-Packard	2
2190-0087	Washer, 0.168 ID	Hewlett-Packard	4
2510-0105	Screw, 8-32 x 0.43	Hewlett-Packard	4
CHART MOTORS			
07130-04103	Stepper Motor, 8-Speed	Hewlett-Packard	1

Table 6-4. Code List of Manufacturers

Mfr. No.	Manufacturer Name	Address	Zip Code
GB027	Neohm	England	
0062P	Pacific Belting Industries, Inc.		
01121	Allen Bradley Company	Milwaukee, Wisc.	53212
01295	Texas Instruments Inc., Semiconductor Component Div.	Dallas, Texas	75231
03888	Pyrofilm Corporation	Whippany, N.J.	07981
04713	Motorola Semiconductor Products, Inc.	Phoenix, Ariz.	85008
06090	Raychem Corporation	Menlo Park, Ca.	94025
06229	Electrovert, Inc.	Mt. Vernon, N.Y.	10553
06383	Panduit Corporation	Tinley Park, Ill.	60477
07322	Minnesota Rubber Co.	Minneapolis, Minn.	55416
09023	Cornell-Dubilier Elek Div. Fed Pac	Sanford, N.C.	27330
09353	C and K Components, Inc.	Watertown, Ma.	02172
12697	Clarostat Mft. Co., Inc.	Dover, N.H.	03820
14140	Edison Elek Div. of McGraw-Edison Co.	Manchester, N.H.	03130
14752	Electro Cube, Inc.	San Gabriel, Ca.	91776
16299	Corning Glass Works, Electric Component Div.	Raleigh, N.C.	27604
17405	Graphic Contr Corp. RCDG Chart Div.	Buffalo, N.Y.	14210
19701	Mepco/Electra Corporation	Mineral Wells, Texas	76067
24546	Corning Glass Works	Bradford, Pa.	16701
26365	Gries Reproducer Corp.	New Rochelle, N.Y.	10802
27014	National Semiconductor Corp.	Santa Clara, Ca.	95051
28480	Hewlett-Packard Co., Corporate Hq.	Palo Alto, Ca.	94304
30983	Mepco/Electra Corporation	San Diego, Ca.	92121
56289	Sprague Electric Co.	North Adams, Ma.	01247
56878	Standard Pressed Steel Co.	Jenkintown, Pa.	19046
71400	Bussman Mfg., Div. of McGraw-Edison Co.	St. Louis, Mo.	63017
71785	TRW Elek Components Cinch Div.	Elk Grove Village, Ill.	60007
72800	Eaton Corp., Reliance Div.	Massillon, Oh.	44640
73138	Beckman Instruments Inc., Helipot Div.	Fullerton, Ca.	92634
73734	Federal Screw Products Co.	Chicago, Ill.	60618
73743	Fischer Special Mfg. Co.	Cincinnati, Oh.	45206
78189	Illinois Tool Works, Inc., Shakeproof	Elgin, Ill.	60126
78553	Tinnerman Products, Inc.	Cleveland, Oh.	44129
79136	Waldes-Kohinoor, Inc.	Long Island City, N.Y.	11101
82389	Switchcraft, Inc.	Chicago, Ill.	60630
83259	Parker Seal Co., Div. Parker-Hannifin	Culver City, Ca.	90231
84411	TRW Capacitor Div.	Ogallala, Ne.	69153
86928	Seastrom Mfg. Co.	Glendale, Ca.	91201
90949	Amphenol Sales, Div. of Bunker-Ramo	Hazelwood, Mo.	63042
91500	Asheville-Schoonmaker Mica Co.	Newport News, Md.	23607
91637	Dale Electronics, Inc.	Columbus, Ne.	68601
97464	Industrial Retaining Ring Co.	Irvington, N.J.	07111



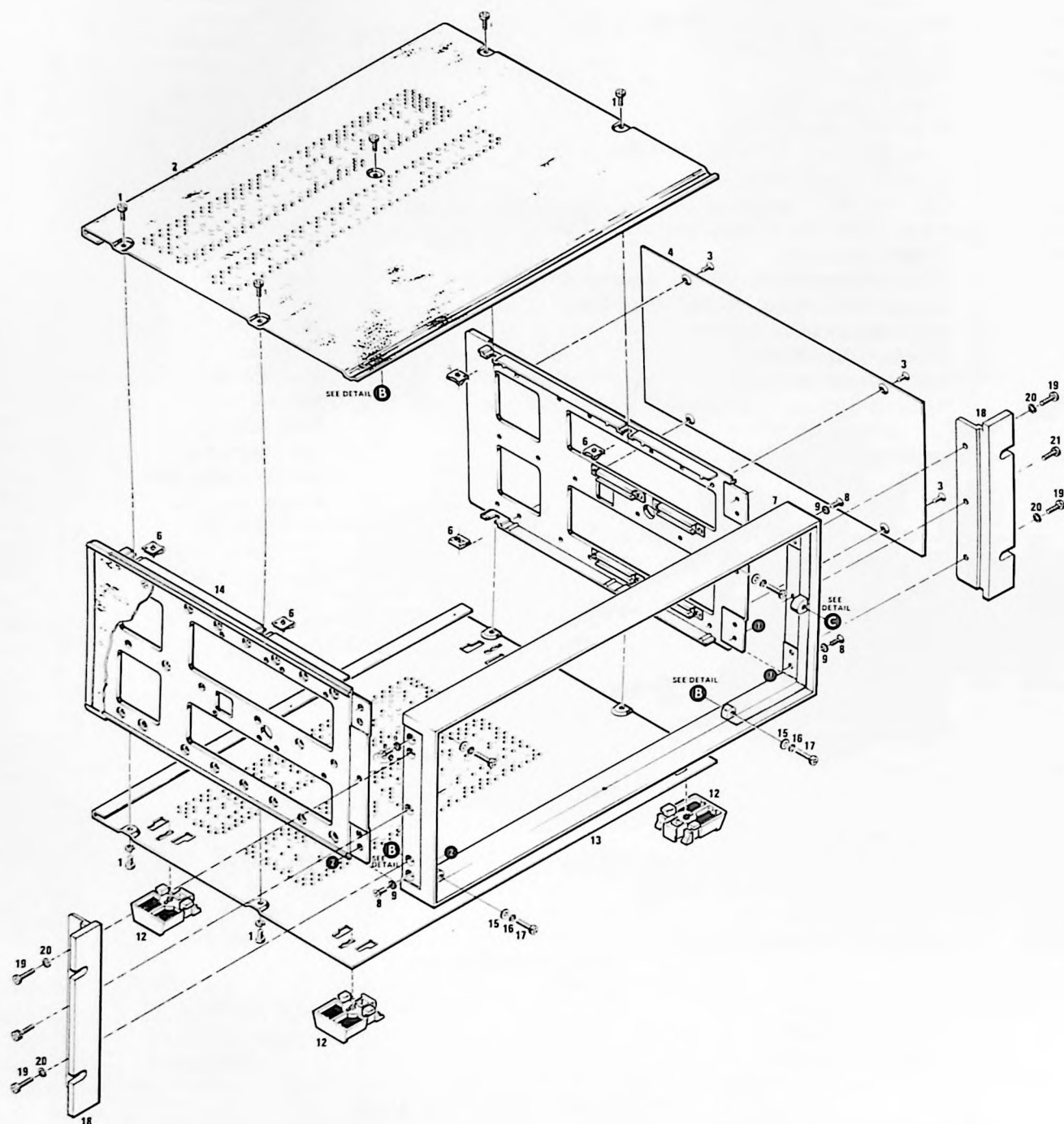
**A**

Figure 6-1. Main Frame, Model 7132A (Sheet 1 of 2)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
			DETAIL "A"		
1	2360-0195	3	SCREW-MACH 6-32 PAN HD POZI REC SST-300	28480	2360-0195
2	07130-05110	1	COVER, TOP	28480	07130-05110
3	2360-0182	1	SCREW-MACH 6-32 82 DEG FL HD POZI REC	28480	2360-0182
4	07130-05130	1	COVER, SIDE	28480	07130-05130
5	07130-65020	1	CASTING, SIDE, R.H. ASSY	28480	07130-65020
6	0510-0275	1	NUT-SHEETMETAL-U 6-32-THD .5-WD STL	78553	C8J91-632-248
7	07130-65010	1	CASTING	28480	07130-65010
8	2510-0098	1	SCREW-MACH 8-32 100 DEG FL HD POZI REC	28480	2510-0098
9	2190-0919	1	WASHER; DOME PL PRPHY; DOME PL PRPHY	78189	1508-04
10	2360-0192	1	SCREW-MACH 6-32 100 DEG FL HD POZI REC	28480	2360-0192
11	2190-0915	1	WASHER-LK 100 CTSK EX NO. 6 .142 IN D	78189	1506-01
12	5060-0767	1	FOOT ASSY:FM	28480	5060-0767
13	07130-05120	1	COVER, BOTTOM	28480	07130-05120
14	07130-65030	1	CASTING, SIDE, L.H. ASSY	28480	07130-65030
15	3050-0393	1	WASHER-FL MTLC NO. 5 .13 IN D .313 IN	28480	3050-0393
16	2190-0105	8	WASHER-LK HLCL NO. 6 .141 IN D .239 IN	28480	2190-0105
17	2360-0205	2	SCREW-MACH 6-32 PAN HD POZI REC SST-300	28480	2360-0205
18	07130-65070	1	EAR RACK ASSY	28480	07130-65070
19	2510-0105	1	SCREW-MACH 8-32 PAN HD POZI REC SST-300	28480	2510-0105
20	2190-0087	1	WASHER-LK HLCL NO. 8 .168 IN D .296 IN	72800	KANTLINK
21	2360-0119	1	SCREW-MACH 6-32 PAN HD POZI REC SST-300	28480	2360-0119

Figure 6-1. Main Frame, Model 7132A (Sheet 2 of 2)

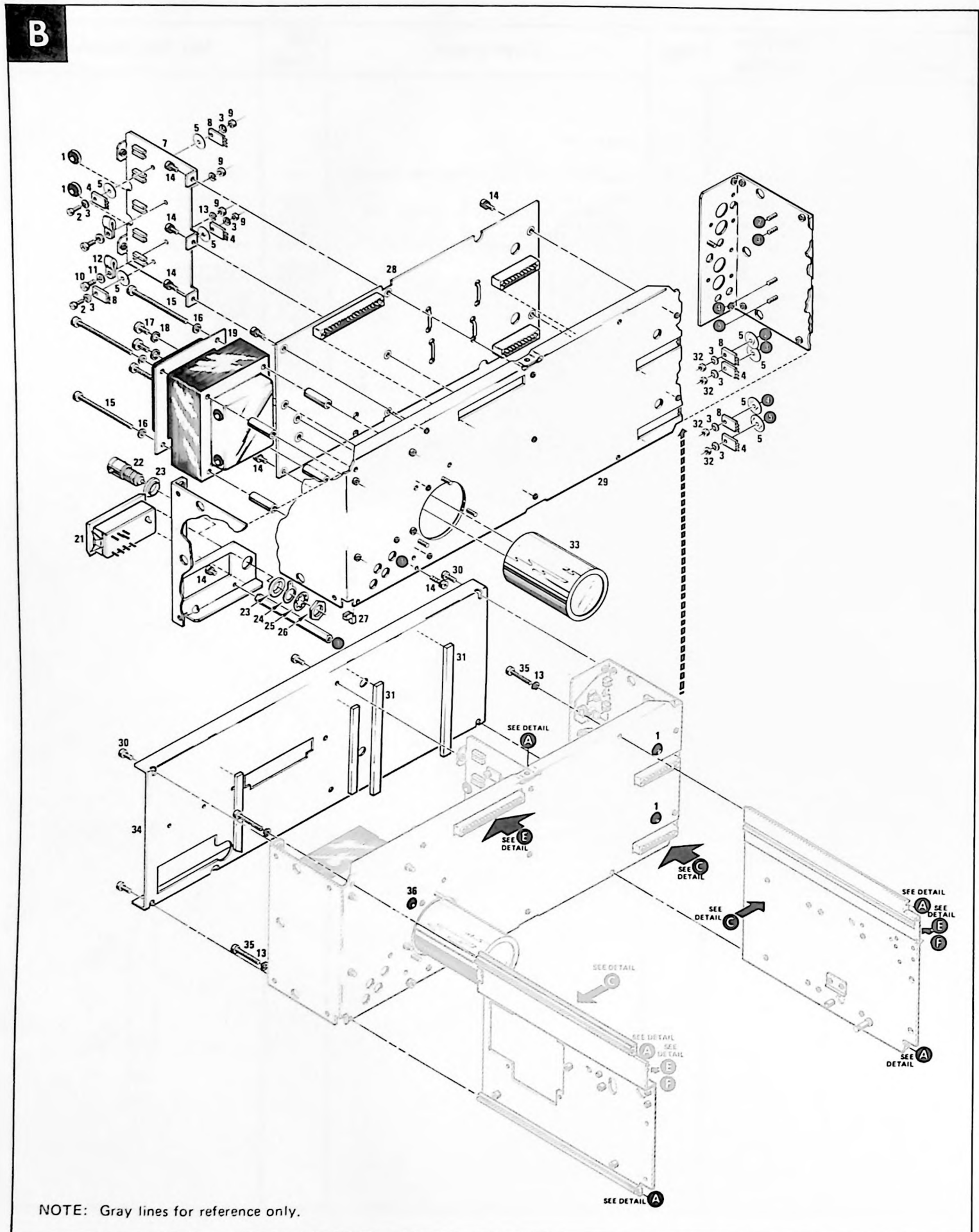
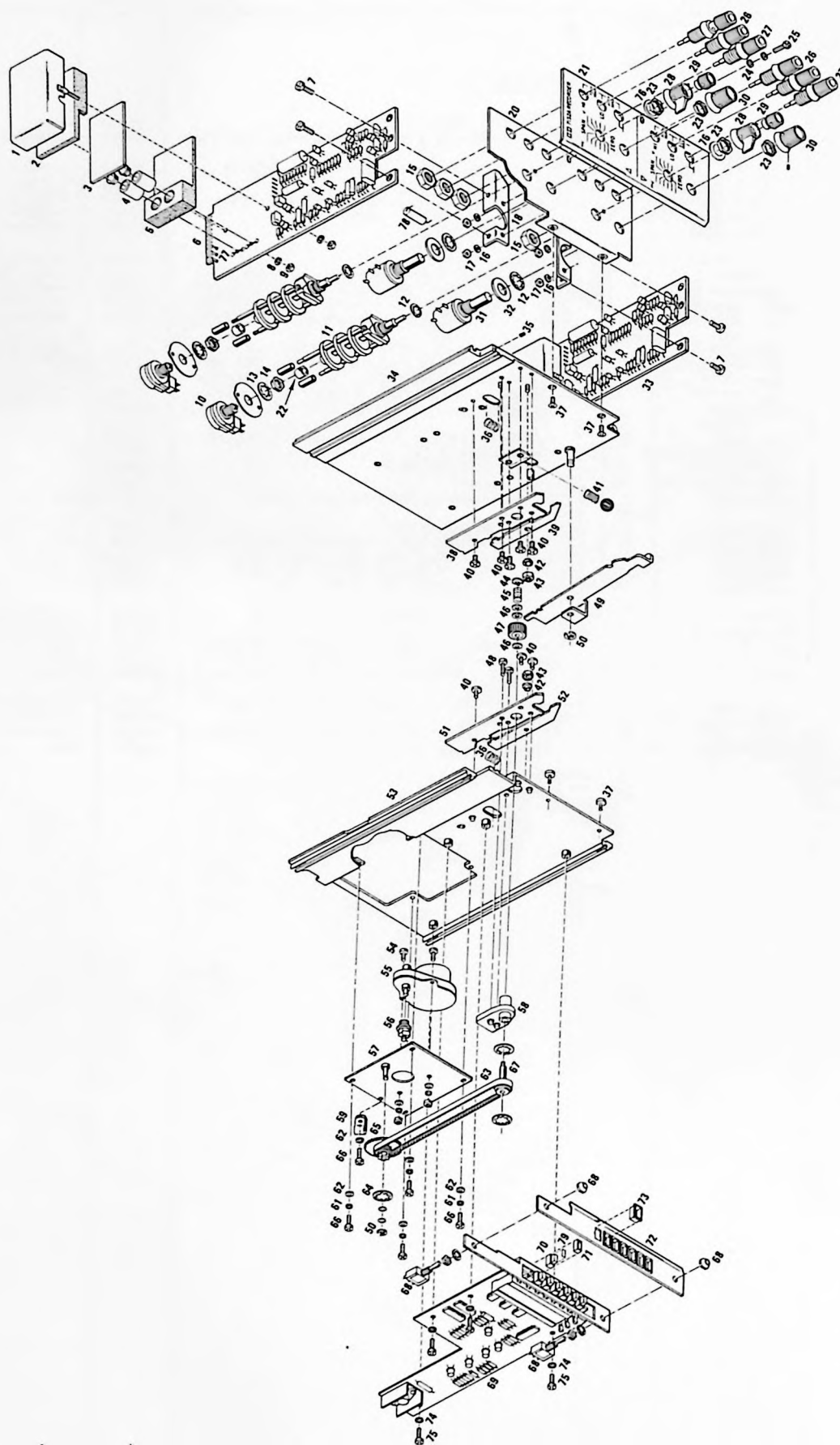


Figure 6-2. Rear Frame, Model 7132A (Sheet 1 of 2)



Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
			DETAIL "B"		
1	0340-0134	1	GROMMET, VINYL 1/4" ID	00000	080
2	2360-0229	3	SCREW-MACH 6-32 PAN HD POZI REC SST-300	28480	2360-0229
3	2190-0925	1	WASHER-LOCK NO. 6 .144 IN D .327 IN D	04713	52-200-F002
4	07130-65100	1	TRANSISTOR ASSY	28480	07130-65100
5	0340-0450	1	INSULATOR, XSTR, X58A, .145 ID, .003	91500	1485852600F13
6	0403-0131	1	GUIDE, P.C. BOARD, GRAY	28480	0403-0131
7	07130-05090	1	BRACKET-BOARD	28480	07130-05090
8	07130-65090	1	TRANSISTOR ASSY	28480	07130-65090
9	2420-0010	6	NUT-HEX-DBL CHAM 6-32-THD .125-THK .25	28480	2420-0010
10	2360-0199	3	SCREW-MACH 6-32 PAN HD POZI REC SST-300	28480	2360-0199
11	3050-0399	3	WASHER-FL MTLC NO. 6 .143 IN D .375 IN	28480	3050-0399
12	0510-0791	1	CLAMP, CABLE, .187 DIA .5 W .826 L ETH	28480	0510-0791
13	2190-0105		WASHER-LK HLCL NO. 6 .141 IN D .239 IN	28480	2190-0105
14	2360-0115	2	SCREW-MACH 6-32 PAN HD POZI REC SST-300	28480	2360-0115
15	2510-0137	1	SCREW-MACH 8-32 PAN HD POZI REC SST-300	28480	2510-0137
16	2190-0009	1	WASHER-LK INTL T NO. 8 .168 IN D .34	73734	1333
17	2680-0099	1	SCREW-MACH 10-32 PAN HD POZI REC SST	28480	2680-0099
18	2190-0011	1	WASHER-LK INTL T NO. 10 .195 IN D .381	78189	1910-00
19	07130-65110	1	TRANSFORMER ASSY	28480	07130-65110
20	07130-25060	1	SPACER, TRANSFORMER	28480	07130-25060
21	5060-9414	1	POWER MODULE	28480	5060-9414
22	1250-0118	1	CONNECTOR-CCAX; BNC; 50 OHM FEMALE	90949	31-2221-1022
23	5040-0702	1	INSULATOR:CONNECTOR	28480	5040-0702
24	0360-1190	1	TERMINAL, SLD R LUG, 3/8 SCR, .38/.078	28480	0360-1190
25	2190-0163	2	WASHER-LK INTL T .38 IN D .567 IN D	78189	1220-05
26	2950-0001	1	NUT-HEX-DBL CHAM 3/8-32-THD .054-THK .5	12697	20/4-13
27	0400-0104	1	GROMMET, CHANNEL, POLYETH	06229	GS-3
28	07130-61100	1	MOTHER BOARD, STANCARD	28480	07130-61100
29	07130-05010	1	FRAME, REAR	28480	07130-05010
30	2360-0195		SCREW-MACH 6-32 PAN HD POZI REC SST-300	28480	2360-0195
31	0460-0518	1	TAPE, INDUSTRIAL 0.375" WIDE	07322	4108
32	2420-0010		NUT-HEX-DBL CHAM 6-32-THD .125-THK .25	28480	2420-0010
33	0180-2497	1	CAPACITOR-FXD; 390UF+75-10% 75VDC AL	56289	360392G0758828
34	07130-05145	1	COVER, REAR	28480	07130-05145
35	2360-0205		SCREW-MACH 6-32 PAN HD POZI REC SST-300	28480	2360-0205
36	0340-0135	1	GROMMET, VINYL 3/8" ID	00000	080

Figure 6-2. Rear Frame, Model 7132A (Sheet 2 of 2)

**C**

NOTE: Gray lines for reference only.

Figure 6-3. Gear Housing Assembly, Model 7132A (Sheet 1 of 2)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
			DETAIL "C"		
1	07130-05300	1	SHIELD, COPPER	28480	07130-05300
2	07130-25140	1	INSULATOR, THERMAL	28480	07130-25140
3	07130-61400	1	CHOPPER	28480	07130-61400
3	07130-61401	1	FILTER	28480	07130-61401
4	0890-0291	1	TUBING HS .375 O/.187 RCVD .02 WALL	06090	RNF-17J-3/8
5	07130-25150	1	INSULATOR, THERMAL	28480	07130-25150
6	07130-61300	2	PREAMPLIFIER	28480	07130-61300
7	2360-0115		SCREW-MACH 6-32 PAN HD POZI REC SST-300	28480	2360-0115
8	2190-0105		WASHER-LK HLCL NO. 6 .141 IN D .239 IN	28480	2190-0105
9	2420-0010		NUT-HEX-DBL CHAM 6-32-THD .125-THK .25	28480	2420-0010
10	2100-3393	1	RESISTOR, VAR W/SW. 50K 1% LIN	28480	2100-3393
11	3100-3297	1	SWITCH, ROTARY	28480	3100-3297
12	2190-0163		WASHER-LK INTL T .38 IN D .567 IN D	78189	1220-75
13	2190-0027	1	WASHER-LK INTL T NO. 1/4 .256 IN D	78189	1914-00
14	2950-0072	1	NUT-HEX-DBL CHAM 1/4-32-THD .062-THK	82389	P-1975
15	2550-0144	1	NUT-HEX-DBL CHAM 3/8-32-THD .188-THK .5	26365	913-891
16	2190-0105		WASHER-LK HLCL NO. 6 .141 IN D .239 IN	28480	2190-0105
17	2420-0010		NUT-HEX-DBL CHAM 6-32-THD .125-THK .25	28480	2420-0010
18	07130-02006	1	BRACKET, UPPER	28480	07130-02006
19	07130-02007	1	BRACKET, LOWER	28480	07130-02007
20	07130-02005	1	SUB-PANEL, RIGHT	28480	07130-02005
21	07130-02018	1	PANEL, CONTROL, RIGHT MARKED (MODEL 7132A)	28480	07130-02018
21	07131-00014	1	PANEL, CONTROL, RIGHT MARKED (MODEL 7133A)	28480	07131-00014
22	5040-0218	1	COUPLER:SWITCH SHAFT	28480	5040-0218
23	2950-0043	1	NUT-HEX-DBL CHAM 3/8-32-THD .094-THK	73743	2X 28200
24	2190-0105		WASHER-LK HLCL NO. 6 .141 IN D .239 IN	28480	2190-0105
25	2360-0195		SCREW-MACH 6-32 PAN HD POZI REC SST-300	28480	2360-0195
26	1510-0091	1	BINDING-POST; SINGLE:3/8-32;JGK/RED;SGL	28480	1510-0091
27	1510-0107	1	BINDING-POST; SINGLE:3/8-32;JGK/BLK;SGL	28480	1510-0107
28	0370-2624	1	KNOB, BAR	28480	0370-2624
29	0370-1017	1	KNOB; CONC; RND; .375 IN; JGK; SGI	26480	0370-1017
30	0370-1091	1	KNOB; BASE; RND; .5 IN; JGK; SGI DECAL	28480	0370-1091
31	2100-2693	1	RESISTOR; VAR; CONT; PREC; 2.5K 5% WW	28480	2100-2693
32	3050-0586	1	WASHER; DOME PL PRPHY; DOME PL PRPHY;	86928	5712-99-62
33	07130-61300		PCB, PREAMPLIFIER	28480	07130-61300
34	07130-65050	2	PARTITION ASSY, RIGHT	28480	07130-65050
35	3030-0493	1	SCREW-SET 4-40 CUP PT HEX REC ALY STL	28480	3030-0493
36	1460-1349	1	SPRING CPRSN-CYL .3-OD .38-LG SST	28480	1460-1349
37	2200-0166	1	SCREW-MACH 4-40 82 DEG FL HD POZI REC	28480	2200-0166
38	1400-0890	1	BRACKET, KEY	28480	1400-0890
39	1400-0889	2	BRACKET, CAM	28480	1400-0889
40	2360-0336	1	SCREW-MACH 6-32 TR HD PHL REC SST-300	28480	2360-0336
41	1460-1350	1	SPRING; COMPRESSION; CYLINDER	28480	1460-1350
42	07130-25120	1	WASHER, SHOULDER	28480	07130-25120
43	0510-0195	1	NUT-HEX-MET LKG 6-32-THD .172-THK .312	56878	FLEXLOC 50FA-632
44	0510-0052	1	RETAINER, RING, .125 DIA, CAD PLT STL	97464	7100-12-CO
45	1460-1373	1	SPRING CPRSN-CYL .15-UD .152-LG SST	28480	1460-1373
46	2190-0378	1	WASHER-FL MTLC NO. 5 .13 IN D .25 IN D	28480	2190-0378
47	07130-63120	1	OUTPUT GEAR ASSY	28480	07130-63120
48	2360-0199		SCREW-MACH 6-32 PAN HD POZI REC SST-300	28480	2360-0199
49	7101-0295	1	LATCH, MAGAZINE	28480	7101-0295
50	0510-0045	2	RETAINER, RING, .188 DIA, CAD PLT STL	97464	1000-18-ST-CO
51	07130-65050		PARTITION ASSY, RIGHT	28480	07130-65050
52	1400-0889		BRACKET, CAM	28480	1400-0889
53	07130-65040	1	PARTITION ASSY, LEFT	28480	07130-65040
54	2200-0141	1	SCREW-MACH 4-40 PAN HD POZI REC SST-300	28480	2200-0141
55	07130-04103	1	CHART MOTOR	28480	07130-04103
56	07130-43110	1	GEAR CLUTCH 18/27 TEETH (50 HZ)	28480	07130-43110
	07143-40130	1	GEAR CLUTCH 15 TEETH (60 HZ)	28480	07143-40130
57	07130-63150	1	PLATE ASSY	28480	07130-63150
58	07130-63160	1	YUKE ASSY	28480	07130-63160
59	0510-0188	1	CLAMP, CABLE RETAINER NUT	28480	0510-0188
60	2260-0001	1	NUT-HEX-DBL CHAM 4-40-THD .094-THK .25	28480	2260-0001
61	2190-0108	4	WASHER-LK HLCL NO. 4 .115 IN D .226 IN	28480	2190-0108
62	2190-0891	2	WASHER-FL MTLC NO. 4 .125 IN D .312 IN	28480	2190-0891
63	1500-0347	1	DRIVE; BELT-GEAR 12.485 L .187 W	28480	1500-0347
64	0510-1174	1	RETAINER; PUSH ON; .5 DIA; CAD PLT STL	28480	0510-1174
65	07130-43120	1	GEAR	28480	07130-43120
66	2200-0091	1	SCREW-MACH 4-40 PAN HD POZI REC SST-300	28480	2200-0091
67	07130-63110	1	PULLEY OUTPUT ASSY	28480	07130-63110
68	3101-1605	1	SWITCH; TGL; SPDT 2A/250VAC ON-NONE-ON	09353	7101PY2I
69	07130-05020	1	PANEL, SUB LEFT	28480	07130-05020
70	0370-0906	1	KNOB; PUSHBUTTON BASE, BLACK	28480	0370-0906
71	0370-0934	1	KNOB, CAP	28480	0370-0934
72	07130-05261		CONTROL PANEL, MARKED	28480	07130-05261
73	0370-0914	1	BEZEL; PUSHBUTTON KNOB, JADE GREY	28480	0370-0914
74	2190-0004	1	WASHER-LK INTL T NO. 4 .115 IN D .27	78189	SF 1904-00
75	2200-0143	4	SCREW-MACH 4-40 PAN HD POZI REC SST-300	28480	2200-0143
76	3050-0067	1	WASHER-FL MTLC .375 IN D .625 IN D	73734	31550
77	5020-0495	1	PIN:SQUARE(TEST POINTS)	28480	5020-0495
78	0160-0819	1	CAPACITOR-FXD .047UF +-10% 600WVDC POLYE	09023	WMF-6547

Figure 6-3. Gear Housing Assembly, Model 7132A (Sheet 2 of 2)



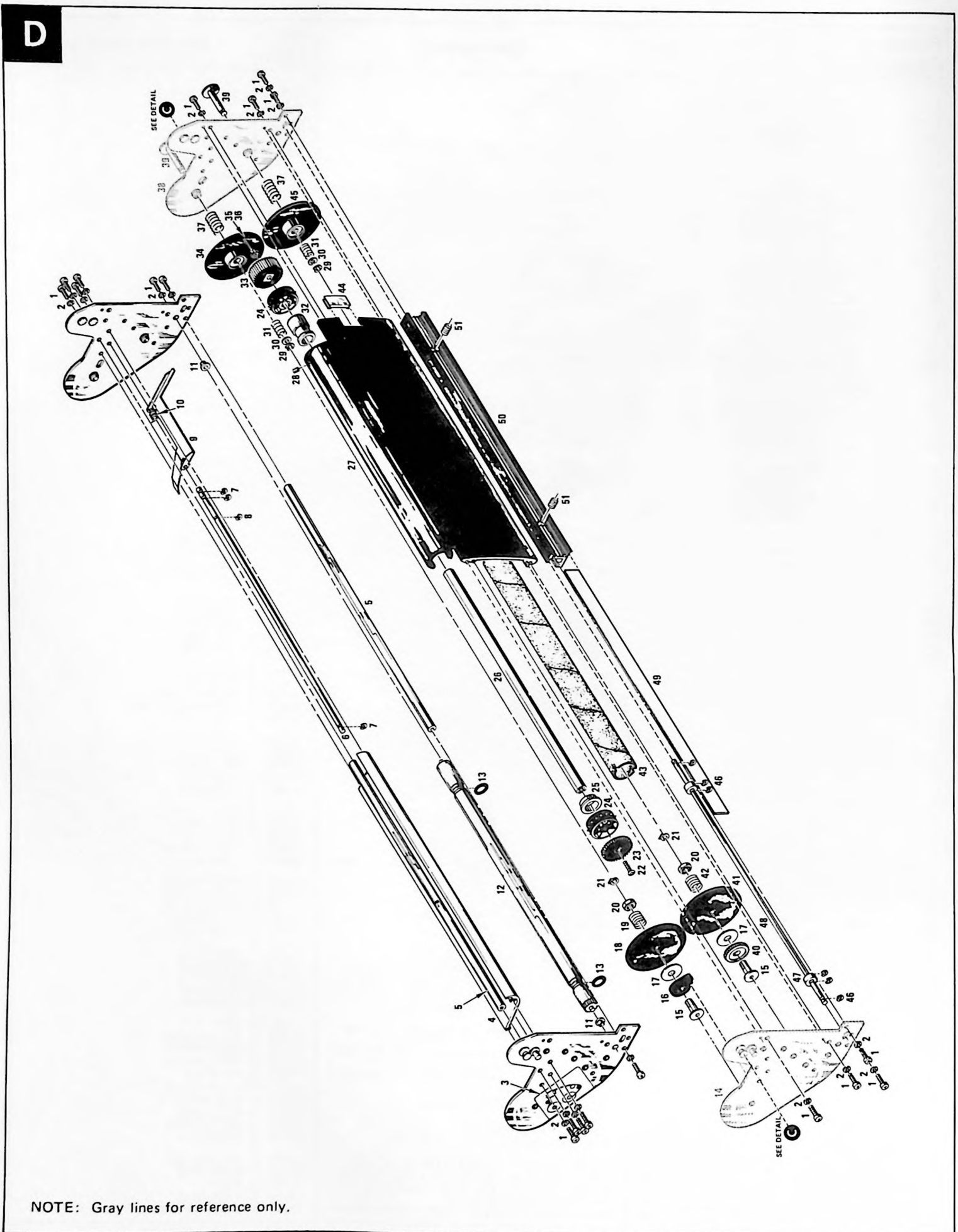
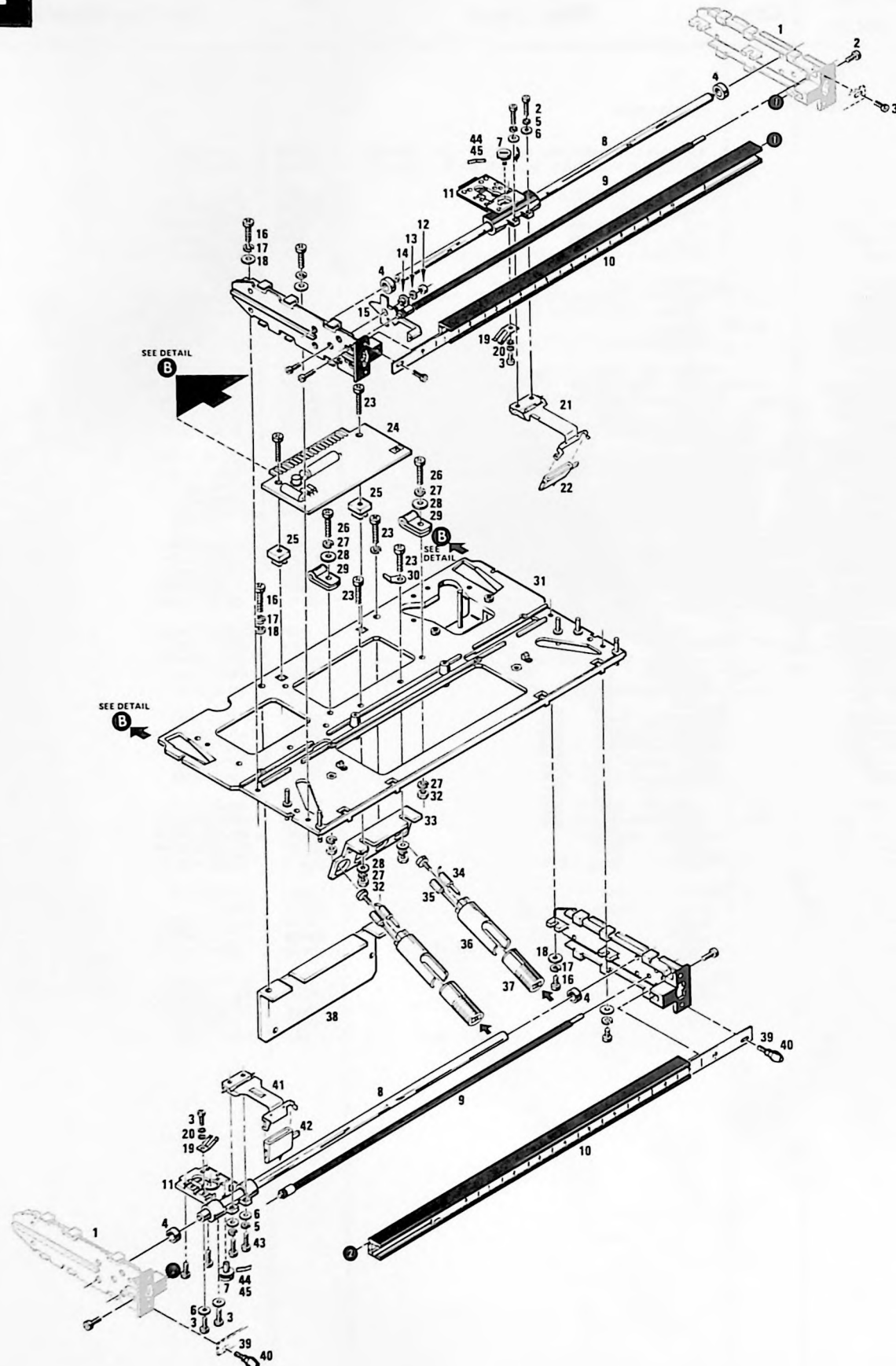


Figure 6-4. Chart Magazine, Model 7132A (Sheet 1 of 2)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
			DETAIL "D"		
1	2200-0143		SCREW-MACH 4-40 PAN HD POZI REC SST-300	28480	2200-0143
2	2190-0108		WASHER-LK HLCL NO. 4 .115 IN D .226 IN	28480	2190-0108
3	7120-3248	1	LABEL, IDENTIFICATION	28480	7120-3248
4	07130-24130	1	PAPER GUIDE	28480	07130-24130
5	07130-24120	1	RCD, PAPER GUIDE	28480	07130-24120
6	07130-24140	1	SHAFT, INDICATOR	28480	07130-24140
7	0510-0015	1	RETAINER, RING, .125 DIA, CAD PLT STL	79136	5133-12-S-MO-R
8	2190-0278	1	WASHER, FLAT	00000	08D
9	1600-0321	1	STAMPING INDICATOR CHART	28480	1600-0321
10	1460-1362	1	SPRING TRSN .18-OD .15-LG SST	28480	1460-1362
11	17999-09561	1	BUSHING	28480	17999-09561
12	07130-64010	1	FEED-OUT SHAFT ASSY	28480	07130-64010
13	0905-0057	1	SEAL "G" RING, 0.364" ID X 0.500" OD	83259	2-12-C147-7
14	07130-64002	1	SIDE PLATE ASSY, LEFT	28480	07130-64002
15	07130-24190	1	BUSHING, CLUTCH HUB	28480	07130-24190
16	07130-44070	1	PLATE, CLUTCH	28480	07130-44070
17	3050-0416	1	WASHER-FL MTLC NO. 1/4 .25 IN D .745	28480	3050-0416
18	07130-24280	1	HUB-SUPPLY-CLUTCH SIDE	28480	07130-24280
19	1460-1303	1	SPRING, COMPRESSION; CYLINDER	28480	1460-1303
20	0590-0147	1	NUT-HEX-OBL CHAM 1/4-28-THD .156-THK	28480	0590-0147
21	0510-0082	1	RETAINER, RING, .125 DIA, BE CU	97464	3100-12-8C
22	2360-0202	1	SCREW-MACH 6-32 100 DEG FL HD POZI REC	28480	2360-0202
23	07143-40180	1	GEAR, 54 TEETH	28480	07143-40180
24	07143-40230	1	SPROCKET, ENGLISH	28480	07143-40230
	07143-40240	1	SPROCKET, METRIC	28480	07143-40240
25	07130-24030	1	BUSHING, SPROCKET	28480	07130-24030
26	07130-24020	1	SHAFT, DRIVE	28480	07130-24020
27	07130-24010	1	PLATEN, MACH	28480	07130-24010
28	3030-0033	1	SCREW-SET 6-32 SMALL CUP PT HEX REC ALY	28480	3030-0033
29	0510-0045	1	RETAINER, RING, .188 DIA, CAD PLT STL	97464	1000-18-ST-CD
30	2190-0181	1	WASHER-FL MTLC .191 IN D .311 IN D	28480	2190-0181
31	1460-1348	1	SPRING CPRSN-CYL .263-OD .3-LG SST	28480	1460-1348
32	07130-24040	1	BUSHING, SPROCKET	28480	07130-24040
33	07130-44090	1	WHEEL- PAPER ADVANCE	28480	07130-44090
34	07130-24270	1	HUB-SUPPLY IDLER SIDE	28480	07130-24270
35	2190-0105	1	WASHER-LK HLCL NO. 6 .141 IN D .239 IN	28480	2190-0105
36	2360-0203	1	SCREW-MACH 6-32 PAN HD POZI REC SST-300	28480	2360-0203
37	1460-1296	1	SPRING CPRSN-CYL .44-OD 1.07-LG SST	28480	1460-1296
38	07130-64003	1	SIDE PLATE ASSY, RIGHT	28480	07130-64003
39	07130-24220	1	SHAFT, IDLER HUB	28480	07130-24220
40	07130-24260	1	GEAR, 45 TEETH	28480	07130-24260
41	07130-44030	1	HUB-TAKE UP- CLUTCH SIDE	28480	07130-44030
42	1460-0530	1	SPRING CPRSN-CYL .48-OD .3-LG SST	28480	1460-0530
43	9280-0275	1	SPOOL, CARDBOARD	00000	08D
44	07130-44080	1	BEZEL, INDICATOR	28480	07130-44080
45	07130-44040	1	HUB-TAKE UP- IDLER SIDE	28480	07130-44040
46	0510-0261	1	RETAINER, RING, .094 DIA, CAD PLT STL	97464	1000-9-ST-CD
47	07130-24080	1	WHEEL-FEED-OUT	28480	07130-24080
48	07130-24090	1	SHAFT, FOLLOWER WHEEL	28480	07130-24090
49	07130-04050	1	PLATE-LOGO	28480	07130-04050
50	07130-24070	1	PAPER TEAR OFF	28480	07130-24070
51	1460-1363	1	SPRING CPRSN-CYL .31-OD .5-LG SST	28480	1460-1363

Figure 6-4. Chart Magazine, Model 7132A (Sheet 2 of 2)

**E**

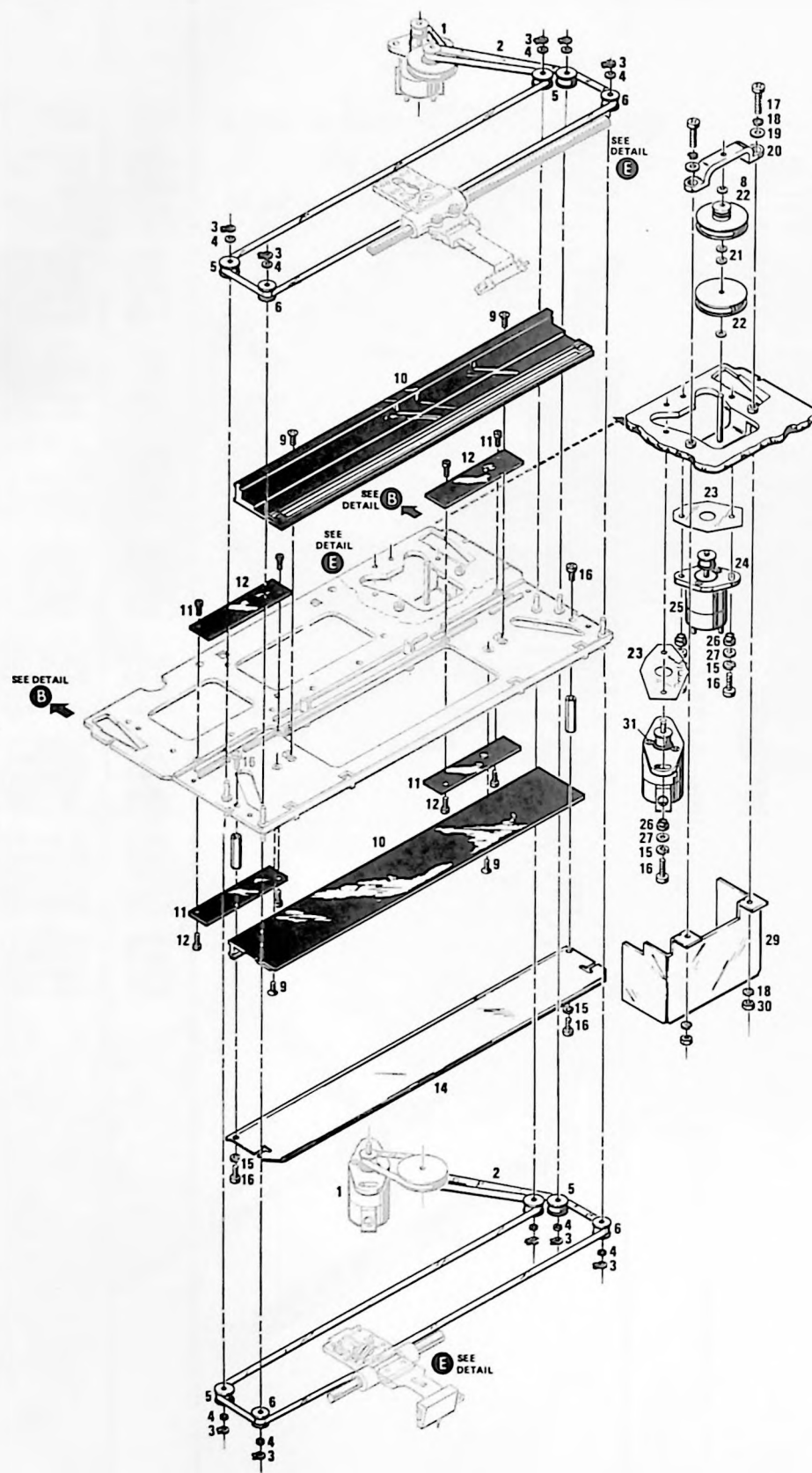
NOTE: Gray lines for reference only.

Figure 6-5. Pen Assembly, Model 7132A (Sheet 1 of 2)



Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
			DETAIL "E"		
1	07130-42200	1	SLIDE, SERVO MODULE	28480	07130-42200
2	0520-0129	1	SCREW-MACH 2-56 PAN HD POZI REC SST-300	28480	0520-0129
3	0624-0295	2	SCREW-TPG 2-56 PAN	28480	0624-0295
4	07130-02520	1	BUMPER	28480	07130-02520
5	2190-0122	1	WASHER, LOCK	00000	080
6	2190-0154	1	WASHER-FL MTLC NO. 2 .099 IN D .25 IN	28480	2190-0154
7	07130-42240	1	PINION, RATCHET	28480	07130-42240
8	07130-22140	2	ROD, SLIDER, 10-INCH	28480	07130-22140
9	07130-22160	1	BAR, PEN LIFT	28480	07130-22160
10	07130-22170	1	SCALE, MOUNT, 10-INCH	28480	07130-22170
11	07130-22200	1	SLIDE BLOCK, MACH	28480	07130-22200
12	0610-0001	1	NUT-HEX-DBL CHAM 2-56-THD .062-THK .188	28480	0610-0001
13	2190-0112	1	WASHER-LK HLCL NO. 2 .088 IN D .175 IN	28480	2190-0112
14	07130-22150	1	PIVOT, HANDLE	28480	07130-22150
15	07130-42221	1	HANDLE, MODIFIED, BLUE	28480	07130-42221
16	2200-0143	1	SCREW-MACH 4-40 PAN HD POZI REC SST-300	28480	2200-0143
17	2190-0108	1	WASHER-LK HLCL NO. 4 .115 IN D .226 IN	28480	2190-0108
18	2190-0891	1	WASHER-FL MTLC NO. 4 .125 IN D .312 IN	28480	2190-0891
19	0363-0073	1	WIPER-CONTACT	00000	080
20	3050-0802	2	WASHER; DOME PL PRPHY; DOME PL PRPHY	86928	5710-7-5
21	07130-60004	1	PEN, UPPER ASSY, BLUE	28480	07130-60004
22	07130-62500	1	PEN, DISPOSABLE, BLUE	28480	07130-62500
23	2360-0229	1	SCREW-MACH 6-32 PAN HD POZI REC SST-300	28480	2360-0229
24	07130-61201	1	SERVO CONNECTOR CIRCUIT BOARD (A13)	28480	07130-61201
25	5040-4527	1	FASTENER	28480	5040-4527
26	2360-0199	1	SCREW-MACH 6-32 PAN HD POZI REC SST-300	28480	2360-0199
27	2190-0105	1	WASHER-LK HLCL NO. 6 .141 IN D .239 IN	28480	2190-0105
28	3050-0399	1	WASHER-FL MTLC NO. 6 .143 IN D .375 IN	28480	3050-0399
29	0510-0800	1	CLAMP, CABLE, .125 DIA .5 W .732 L ETH	28480	0510-0800
30	0360-0365	1	TERMINAL, SLDR LUG, 6 SCR, .143/.093 ID	78189	2104-06-00
31	07130-62100	1	ASSY, SERVO CHASSIS	28480	07130-62100
32	2420-0010	1	NUT-HEX-DBL CHAM 6-32-THD .125-THK .25	28480	2420-0010
33	07130-42290	1	BRACKET, CARTRIDGE HOLDER	28480	07130-42290
34	5060-6496	1	PIERCER VENT ASSY	28480	5060-6496
35	07143-61413	1	PIERCER, SUPPLY ASSY	28480	07143-61413
36	07130-42370	1	HOUSING, PIERCER	28480	07130-42370
37	07130-60002	1	INK CARTRIDGE, BLACK	28480	07130-60002
38	07130-02540	1	BRACKET, MOUNTING	28480	07130-02540
39	07130-22180	1	SCREW, PRIMER	28480	07130-22180
40	9301-0321	1	RUBBER SQUEEZE BULB	17405	RCDG-80-80-0011-99
41	07130-60005	1	PEN, LOWER ASSY, RED	28480	07130-60005
42	07130-62510	1	PEN, DISPOSABLE, RED	28480	07130-62510
43	0520-0130	1	SCREW-MACH 2-56 PAN HD POZI REC SST-300	28480	0520-0130
44	1600-0320	1	LEAF SPRING	28480	1600-0320
45	1600-0319	1	LEAF SPRING	28480	1600-0319
46	2360-0195	2	SCREW, 6-32 X .31	28480	2360-0195

Figure 6-5. Pen Assembly, Model 7132A (Sheet 2 of 2)

**F**

NOTE: Gray lines for reference only.

Figure 6-6. Motor Assembly, Model 7132A (Sheet 1 of 2)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
			DETAIL "F"		
1	1500-0343	1	DRIVE; BELT 5.428 L	28480	1500-0343
2	1500-0348	1	BELT, DRIVEN (38" LG)	28480	1500-0348
3	0510-0724	1	RETAINER, RING, .094 DIA, CAD PLT STL	79136	5555-9-S-MD
4	3050-0802	1	WASHER; DOME PL PRPHY; DOME PL PRPHY	86928	5710-7-5
5	07130-22130	1	PULLEY, REAR	28480	07130-22130
6	07130-22120	1	PULLEY, FRONT	28480	07130-22120
7	0624-0206	1	SCREW-TPG 6-32 PAN	28480	0624-0206
8	0905-0481	1	SEAL "O" RING, 0.208" ID X 0.348" OD	83259	2-009-C147-70
9	2360-0181	1	SCREW-MACH 6-32 82 DEG FL HD POZI REC	28480	2360-0181
10	07130-62160	1	SLIDEWIRE ASSY, SINGLE	28480	07130-62160
11	0624-0295	1	SCREW-TPG 2-56 PAN	28480	0624-0295
12	07130-02330	1	PLATE, CABLE	28480	07130-02330
13	07130-22360	1	STANDOFF, BAFFLE	28480	07130-22360
14	07130-02410	1	BAFFLE, SLIDEWIRE	28480	07130-02410
15	2190-0108	1	WASHER-LK HLCL NO. 4 .115 IN D .226 IN	28480	2190-0108
16	2200-0143	1	SCREW-MACH 4-40 PAN HD POZI REC SST-300	28480	2200-0143
17	2360-0229	1	SCREW-MACH 6-32 PAN HD POZI REC SST-300	28480	2360-0229
18	2190-0105	1	WASHER-LK HLCL NO. 6 .141 IN D .239 IN	28480	2190-0105
19	3050-0399	1	WASHER-FL MTLC NO. 6 .143 IN D .375 IN	28480	3050-0399
20	07130-22140	1	KOD, SLIDER, 10-INCH	28480	07130-22140
21	2190-0368	1	WASHER-FL MTLC NO. 5 .13 IN D .235 IN	28480	2190-0368
22	07130-22110	1	PULLEY, DRIVEN	28480	07130-22110
23	0340-0806	1	INSULATOR; MISC; INSULATOR; .375 ID;	28480	0340-0806
24	07130-22190	1	MOTOR PLATE	28480	07130-22190
25	5060-6659	1	MOTOR ASSY	28480	5060-6659
26	07035-22430	1	WASHER, MOTOR PLATE	28480	07035-22430
27	2190-0376	1	WASHER-FL MTLC NO. 4 .115 IN D .209 IN	28480	2190-0376
28	5060-6660	1	MOTOR ASSY	28480	5060-6660
29	07130-02400	1	BAFFLE, MOTOR	28480	07130-02400
30	2420-0010	1	NUT-HEX-DBL CHAM 6-32-THD .125-THK .25	28480	2420-0010
31	2200-0140	1	SCREW-MACH 4-40 100 DEG FL HD POZI REC	28480	2200-0140

Figure 6-6. Motor Assembly, Model 7132A (Sheet 2 of 2)



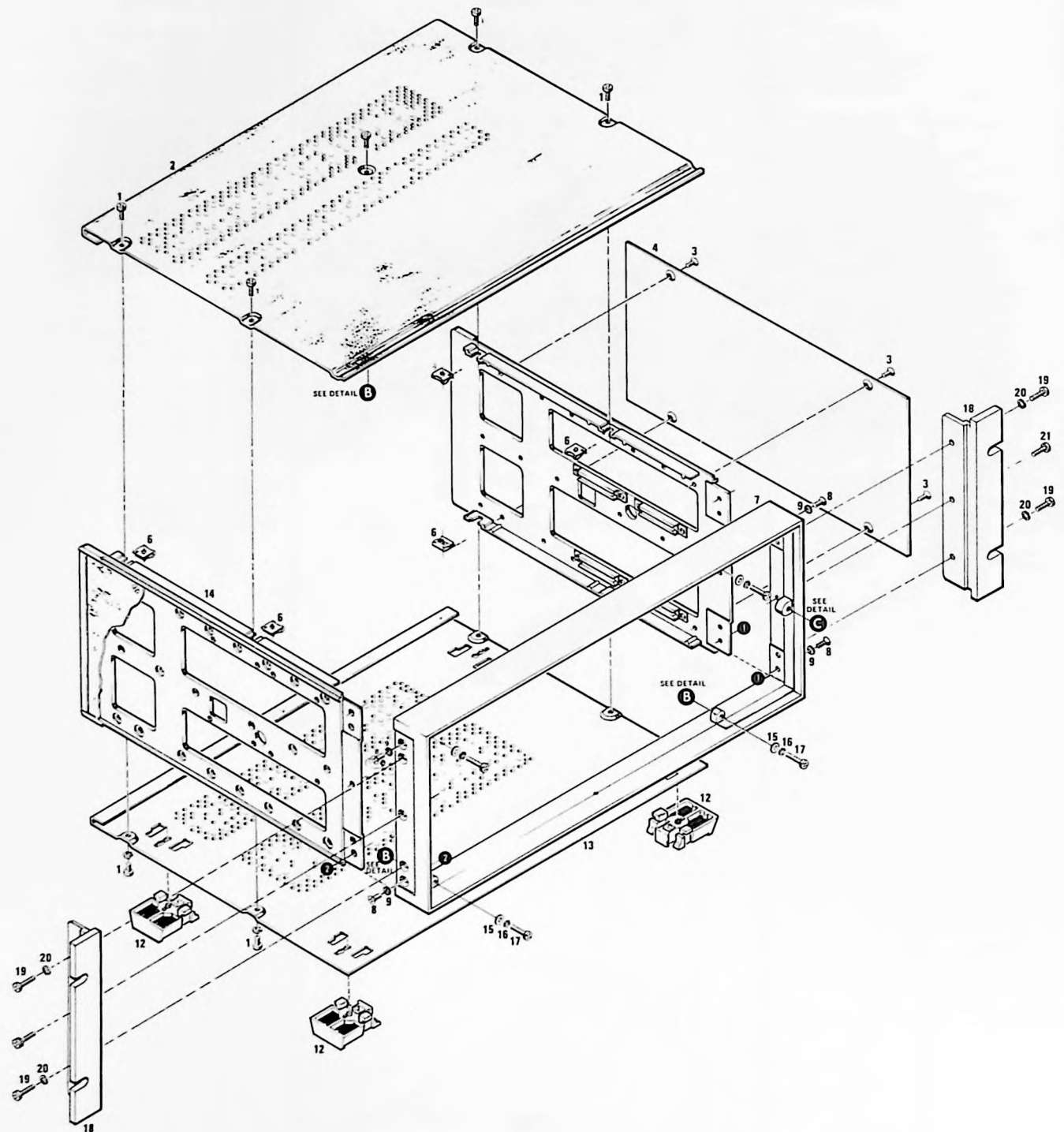
**A**

Figure 6-7. Main Frame, Model 7133A (Sheet 1 of 2)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
			DETAIL "A"		
A1	2360-0195	3	SCREW-MACH 6-32 PAN HD POZI REC SST-300	28480	2360-0195
A2	07130-05110	1	COVER, TOP	28480	07130-05110
A3	2360-0182	1	SCREW-MACH 6-32 82 DEG FL HD POZI REC	28480	2360-0182
A4	07130-05130	1	COVER, SIDE	28480	07130-05130
A5	07130-65020	1	CASTING, SIDE, R.H. ASSY	28480	07130-65020
A6	0510-0275	1	NUT-SHEETMETAL-U 6-32-THD .5-WD STL	78553	C8J91-632-248
A7	07130-65010	1	CASTING	28480	07130-65010
A8	2510-0098	1	SCREW-MACH 8-32 100 DEG FL HD POZI REC	28480	2510-0098
A9	2190-0919	1	WASHER; DOME PL PRPHY; DOME PL PRPHY	78189	153A-04
A10	2360-0192	1	SCREW-MACH 6-32 100 DEG FL HD POZI REC	28480	2360-0192
A11	2190-0915	1	WASHER-LK 100 CTSK EX NO. 6 .142 IN D	78189	1506-01
A12	5060-0767	1	FOOT ASSY:FP	28480	5060-0767
A13	07130-05120	1	COVER, BOTTOM	28480	07130-05120
A14	07130-65030	1	CASTING, SIDE, L.H. ASSY	28480	07130-65030
A15	3050-0393	1	WASHER-FL MTLC NO. 5 .13 IN D .313 IN	28480	3050-0393
A16	2190-0105	8	WASHER-LK HLCL NO. 6 .141 IN D .239 IN	28480	2190-0105
A17	2360-0205	2	SCREW-MACH 6-32 PAN HD POZI REC SST-300	28480	2360-0205
A18	07130-65070	1	EAR RACK ASSY	28480	07130-65070
A19	2510-0105	1	SCREW-MACH 8-32 PAN HD POZI REC SST-300	28480	2510-0105
A20	2190-0087	1	WASHER-LK HLCL NO. 8 .168 IN D .296 IN	72800	KANTLINK
A21	2360-0119	1	SCREW-MACH 6-32 PAN HD POZI REC SST-300	28480	2360-0119

Figure 6-7. Main Frame, Model 7133A (Sheet 2 of 2)

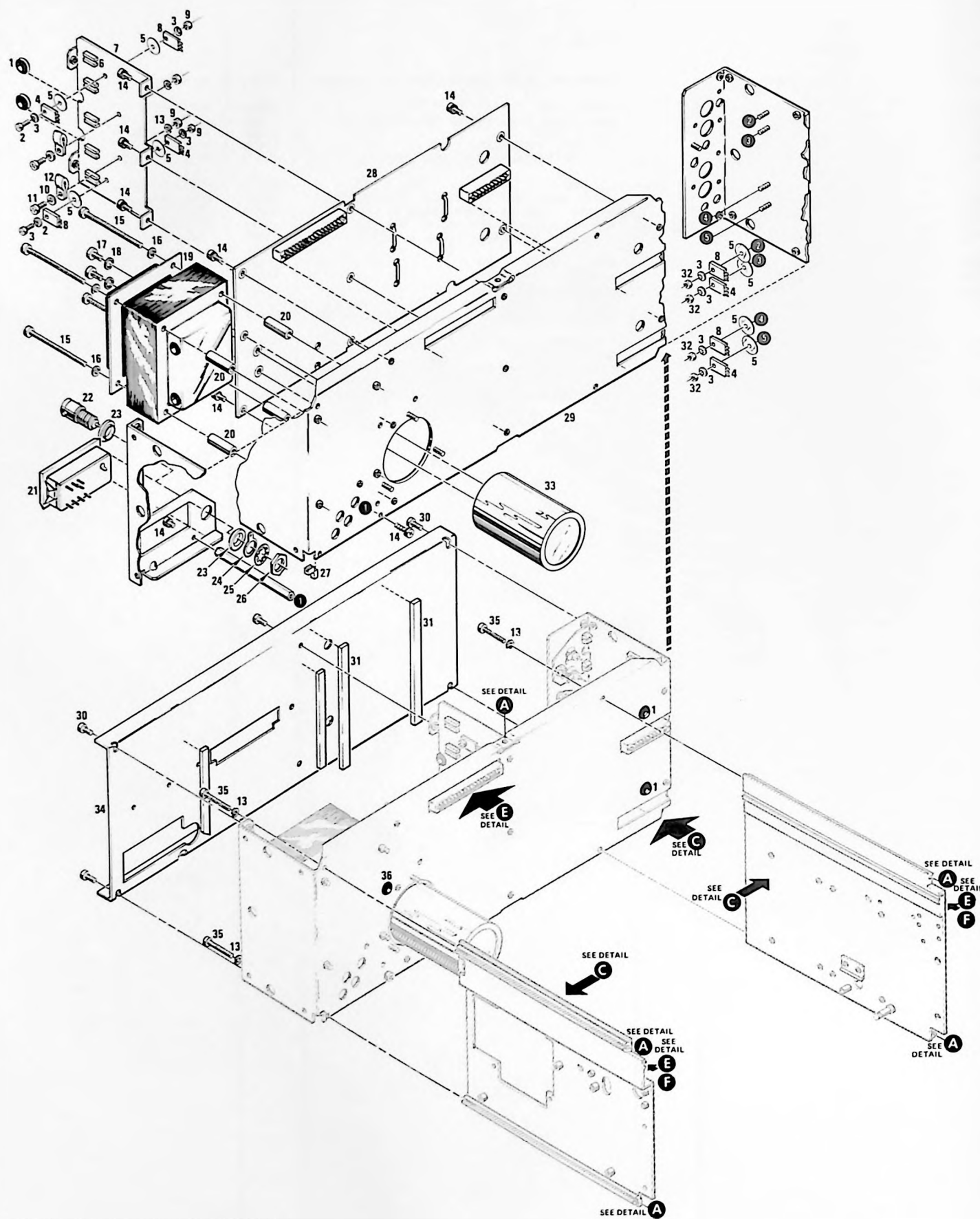
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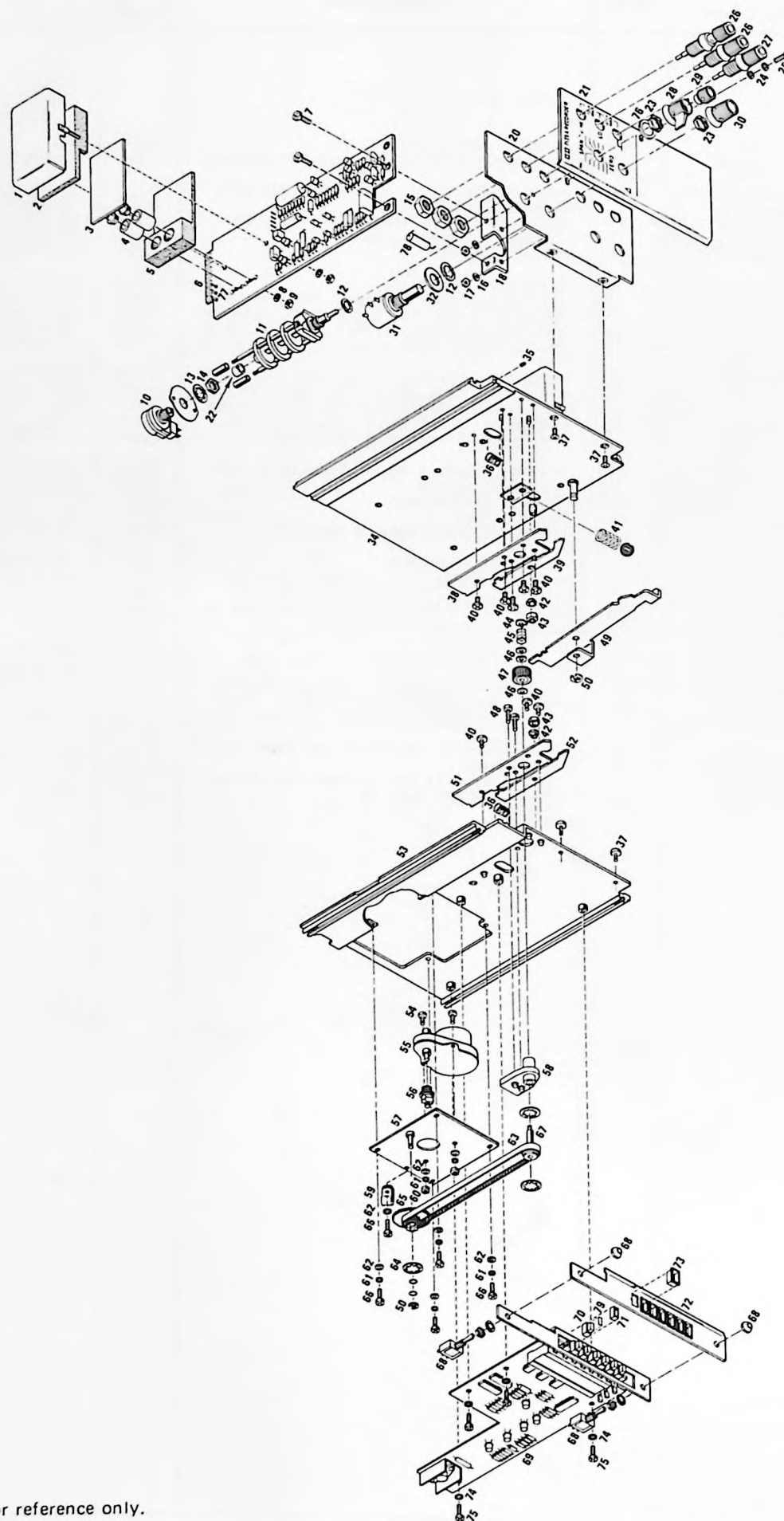
Figure 6-8. Rear Frame, Model 7133A (Sheet 1 of 2)



Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
			DETAIL "B"		
B1	0340-0134	1	GROMMET, VINYL 1/4" ID	00000	080
B2	2360-0229	3	SCREW-MACH 6-32 PAN HD POZI REC SST-300	28480	2360-0229
B3	2190-0925	1	WASHER-LOCK NO. 6 .144 IN D .327 IN D	04713	52-200-F002
B4	07130-65100	1	TRANSISTOR ASSY	28480	07130-65100
B5	0340-0450	1	INSULATOR, XSTR, X58A, .145 ID, .003	91500	14858526J0F13
B6	0403-0131	1	GUIDE, P.C. BOARD, GRAY	28480	0403-0131
B7	07130-05090	1	BRACKET-BOARD	28480	07130-05090
B8	07130-65090	1	TRANSISTOR ASSY	28480	07130-65090
B9	2420-0010	6	NUT-HEX-DBL CHAM 6-32-THD .125-THK .25	28480	2420-0010
B10	2360-0199	3	SCREW-MACH 6-32 PAN HD POZI REC SST-300	28480	2360-0199
B11	3050-0399	3	WASHER-FL MTLC NO. 6 .143 IN D .375 IN	28480	3050-0399
B12	0510-0791	1	CLAMP, CABLE, .187 DIA .5 W .826 L ETH	28480	0510-0791
B13	2190-0105		WASHER-LK HLCL NO. 6 .141 IN D .239 IN	28480	2190-0105
B14	2360-0115	2	SCREW-MACH 6-32 PAN HD POZI REC SST-300	28480	2360-0115
B15	2510-0137	1	SCREW-MACH 8-32 PAN HD POZI REC SST-300	28480	2510-0137
B16	2190-0009	1	WASHER-LK INTL T NO. 8 .168 IN D .34	73734	1333
B17	2680-0099	1	SCREW-MACH 10-32 PAN HD POZI REC SST	28480	2680-0099
B18	2190-0011	1	WASHER-LK INTL T NO. 10 .195 IN D .381	78189	1910-00
B19	07130-65110	1	TRANSFORMER ASSY	28480	07130-65110
B20	07130-25060	1	SPACER, TRANSFORMER	28480	07130-25060
B21	5060-9414	1	POWER MODULE	28480	5060-9414
B22	1250-0118	1	CONNECTOR-CCAX; BNC; 50 OHM FEMALE	90949	31-2221-1022
B23	5040-0702	1	INSULATOR-CONNECTOR	28480	5040-0702
B24	0360-1190	1	TERMINAL, SLDR LUG, 3/8 SCR, .38/.078	28480	0360-1190
B25	2190-0163	2	WASHER-LK INTL T .38 IN D .567 IN D	78189	1220-05
B26	2950-0001	1	NUT-HEX-DBL CHAM 3/8-32-THD .054-THK .5	12697	20/4-13
B27	0400-0104	1	GROMMET, CHANNEL, POLYETH	06229	GS-3
B28	07130-61100	1	MOTHER BOARD, STANCARD	28480	07130-61100
B29	07130-05010	1	FRAME, REAR	28480	07130-05010
B30	2360-0195		SCREW-MACH 6-32 PAN HD POZI REC SST-300	28480	2360-0195
B31	0460-0518	1	TAPE, INDUSTRIAL 0.375" WIDE	07322	4108
B32	2420-0010		NUT-HEX-DBL CHAM 6-32-THD .125-THK .25	28480	2420-0010
B33	0180-2497	1	CAPACITOR-FXD; 3900UF+75-10% 75VDC AL	56289	360392G075BB28
B34	07130-05145	1	COVER, REAR	28480	07130-05145
B35	2360-0205		SCREW-MACH 6-32 PAN HD POZI REC SST-300	28480	2360-0205
B36	0340-0135	1	GROMMET, VINYL 3/8" ID	00000	080

Figure 6-8. Rear Frame, Model 7133A (Sheet 2 of 2)

C



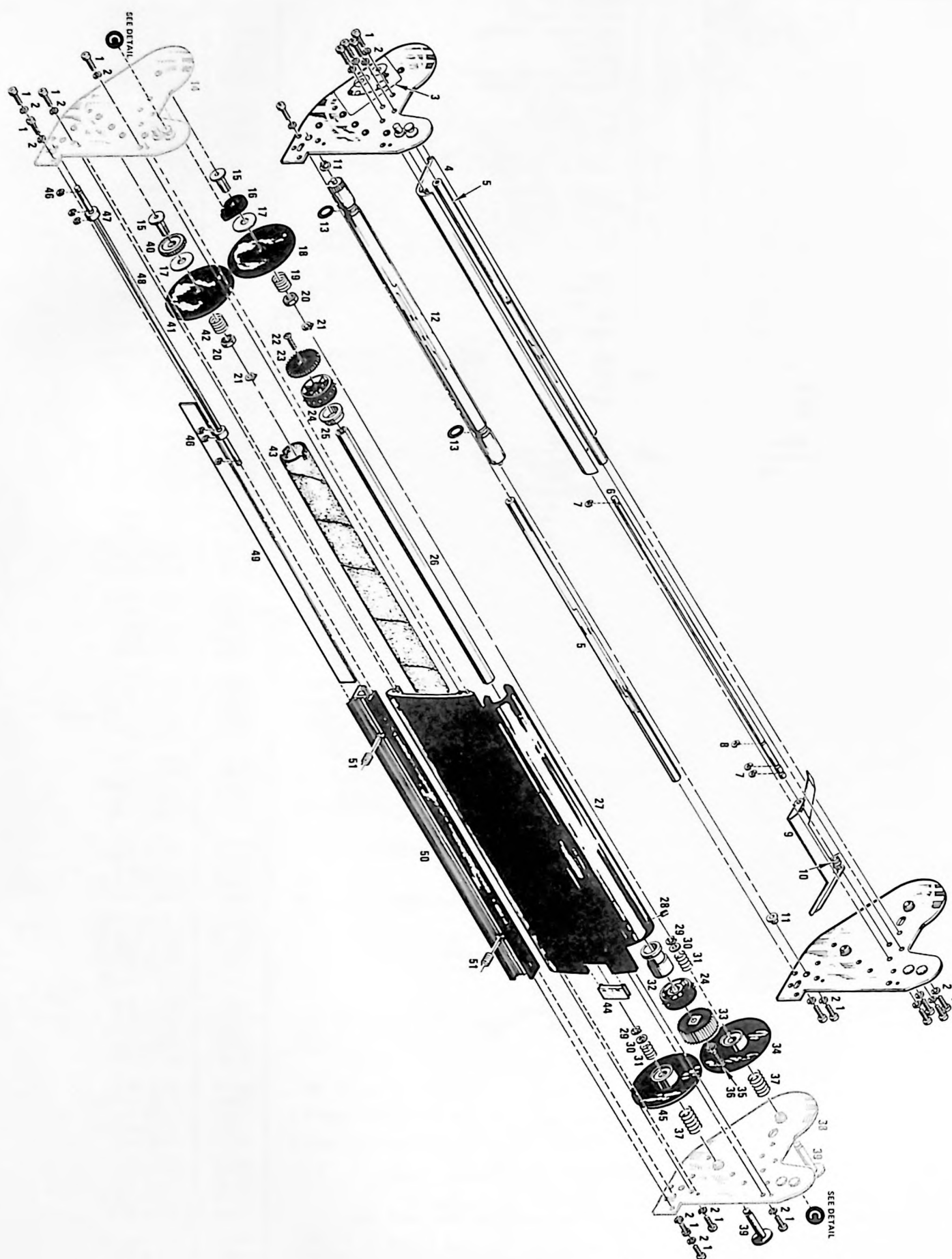
NOTE: Gray lines for reference only.

Figure 6-9. Gear Housing Assembly, Model 7133A (Sheet 1 of 2)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
1	07130-05300	1	DETAIL "C"		
2	07130-25140	1	SHIELD, COPPER	28480	07130-05300
3	07130-61400	1	INSULATOR, THERMAL	28480	07130-25140
4	07130-61401	1	CHOPPER	28480	07130-61400
5	0890-0291	1	FILTER	28480	07130-61401
6	07130-25150	1	TUBING HS .375 D/.187 RCVD .02 WALL	06090	RF-17J-3/8
7		1	INSULATOR, THERMAL	28480	07130-25150
8	07130-61300	2	PREAMPLIFIER	23480	07130-61300
9	2360-0115		SCREW-MACH 6-32 PAN HD POZI REC SST-300	28480	2360-0115
10	2190-0105		WASHER-LK HLCL NO. 6 .141 IN D .239 IN	28480	2190-0105
11	2420-0010		NUT-HEX-DBL CHAM 6-32-THD .125-THK .25	28480	2420-0010
12	2100-3393	1	RESISTOR, VAR W/SW. 50K 1% LIN	28480	2100-3393
13	3100-3297	1	SWITCH, ROTARY	28480	3100-3297
14	2190-0163		NUT-HEX-DBL CHAM 6-32-THD .125-THK .25	78189	1220-75
15	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	78189	1914-00
16	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	82389	P-1975
17	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	26365	913-891
18	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	2190-0105
19	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	2420-0010
20	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02006
21	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
22	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
23	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
24	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
25	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
26	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
27	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
28	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
29	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
30	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
31	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
32	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
33	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
34	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
35	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
36	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
37	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
38	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
39	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
40	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
41	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
42	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
43	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
44	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
45	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
46	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
47	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
48	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
49	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
50	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
51	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
52	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
53	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
54	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
55	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
56	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
57	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
58	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
59	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
60	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
61	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
62	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
63	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
64	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
65	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
66	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
67	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
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69	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
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72	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
73	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
74	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
75	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
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77	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007
78	2190-0163	1	WASHER-LK INTL T NO. 4 .115 IN D .220 IN	28480	07130-02007

Figure 6-9. Gear Housing Assembly, Model 7133A (Sheet 2 of 2)



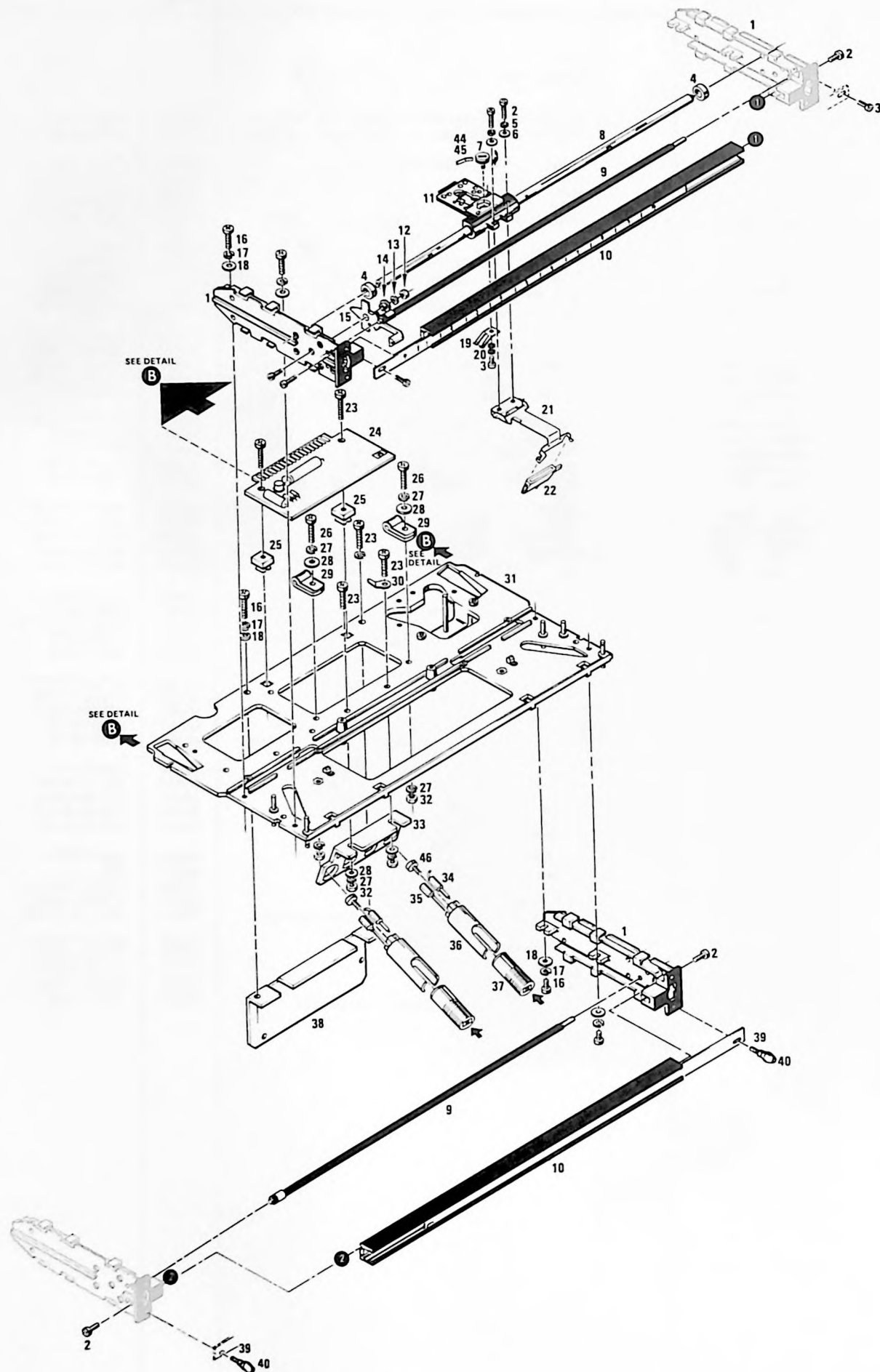
**D**

NOTE: Gray lines for reference only.

Figure 6-10. Chart Magazine, Model 7133A (Sheet 1 of 2)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
			DETAIL "D"		
1	2200-0143		SCREW-MACH 4-40 PAN HD POZI REC SST-300	28480	2200-0143
2	2190-0108		WASHER-LK HLCL NO. 4 .115 IN D .226 IN	28480	2190-0108
3	7120-3248	1	LABEL, IDENTIFICATION	28480	7120-3248
4	07130-24130	1	PAPER GUIDE	28480	07130-24130
5	07130-24120	1	ROD, PAPER GUIDE	28480	07130-24120
6	07130-24140	1	SHAFT, INDICATOR	28480	07130-24140
7	0510-0015	1	RETAINER, RING, .125 DIA, CAD PLT STL	79136	5133-12-S-MD-R
8	2190-0278	1	WASHER, FLAT	00000	080
9	1600-0321	1	STAMPING INDICATOR CHART	28480	1600-0321
10	1460-1362	1	SPRING TRSN .18-OD .15-LG SST	28480	1460-1362
11	17999-09561	1	BUSHING	28480	17999-09561
12	07130-64010	1	FEED-OUT SHAFT ASSY	28480	07130-64010
13	0905-0057	1	SEAL "O" RING, 0.364"ID X 0.500"OD	83259	2-12-C147-7
14	07130-64002	1	SIDE PLATE ASSY, LEFT	28480	07130-64002
15	07130-24190	1	BUSHING, CLUTCH HUB	28480	07130-24190
16	07130-44070	1	PLATE, CLUTCH	28480	07130-44070
17	3050-0416	1	WASHER-FL MTLC NO. 1/4 .25 IN D .745	28480	3050-0416
18	07130-24280	1	HUB-SUPPLY-CLUTCH SIDE	28480	07130-24280
19	1460-1303	1	SPRING; COMPRESSION; CYLINDER	28480	1460-1303
20	0590-0147	1	NUT-HEX-DBL CHAM 1/4-28-THD .156-TMK	28480	0590-0147
21	0510-0082	1	RETAINER, RING, .125 DIA, BE CU	97464	3100-12-8C
22	2360-0202	1	SCREW-MACH 6-32 100 DEG FL HD POZI REC	28480	2360-0202
23	07143-40180	1	GEAR, 54 TEETH	28480	07143-40180
24	07143-40230	1	SPROCKET, ENGLISH	28480	07143-40230
	07143-40240	1	SPROCKET, METRIC	28480	07143-40240
25	07130-24030	1	BUSHING, SPROCKET	28480	07130-24030
26	07130-24020	1	SHAFT, DRIVE	28480	07130-24020
27	07130-24010	1	PLATEN, MACH	28480	07130-24010
28	3030-0033	1	SCREW-SET 6-32 SMALL CUP PT HEX REC ALY	28480	3030-0033
29	0510-0045	1	RETAINER, RING, .188 DIA, CAD PLT STL	97464	1000-18-ST-CD
30	2190-0181	1	WASHER-FL MTLC .191 IN D .311 IN D	28480	2190-0181
31	1460-1348	1	SPRING CPRSN-CYL .263-OD .3-LG SST	28480	1460-1348
32	07130-24040	1	BUSHING, SPROCKET	28480	07130-24040
33	07130-44090	1	WHEEL- PAPER ADVANCE	28480	07130-44090
34	07130-24270	1	HUB-SUPPLY IDLER SIDE	28480	07130-24270
35	2190-0105	1	WASHER-LK HLCL NO. 6 .141 IN D .239 IN	28480	2190-0105
36	2360-0203	1	SCREW-MACH 6-32 PAN HD POZI REC SST-300	28480	2360-0203
37	1460-1296	1	SPRING CPRSN-CYL .44-OD 1.07-LG SST	28480	1460-1296
38	07130-64003	1	SIDE PLATE ASSY, RIGHT	28480	07130-64003
39	07130-24220	1	SHAFT, IDLER HUB	28480	07130-24220
40	07130-24260	1	GEAR, 45 TEETH	28480	07130-24260
41	07130-44030	1	HUB-TAKE UP- CLUTCH SIDE	28480	07130-44030
42	1460-0530	1	SPRING CPRSN-CYL .48-OD .3-LG SST	28480	1460-0530
43	9280-0275	1	SPOOL, CARDBOARD	00000	080
44	07130-44080	1	BEZEL, INDICATOR	28480	07130-44080
45	07130-44040	1	HUB-TAKE UP- IDLER SIDE	28480	07130-44040
46	0510-0261	1	RETAINER, RING, .094 DIA, CAD PLT STL	97464	1000-9-ST-CD
47	07130-24080	1	WHEEL-FEED-OUT	28480	07130-24080
48	07130-24090	1	SHAFT, FOLLOWER WHEEL	28480	07130-24090
49	07130-04050	1	PLATE-LOGO	28480	07130-04050
50	07130-24070	1	PAPER TEAR OFF	28480	07130-24070
51	1460-1363	1	SPRING CPRSN-CYL .31-OD .5-LG SST	28480	1460-1363

Figure 6-10. Chart Magazine, Model 7133A (Sheet 2 of 2)

**E**

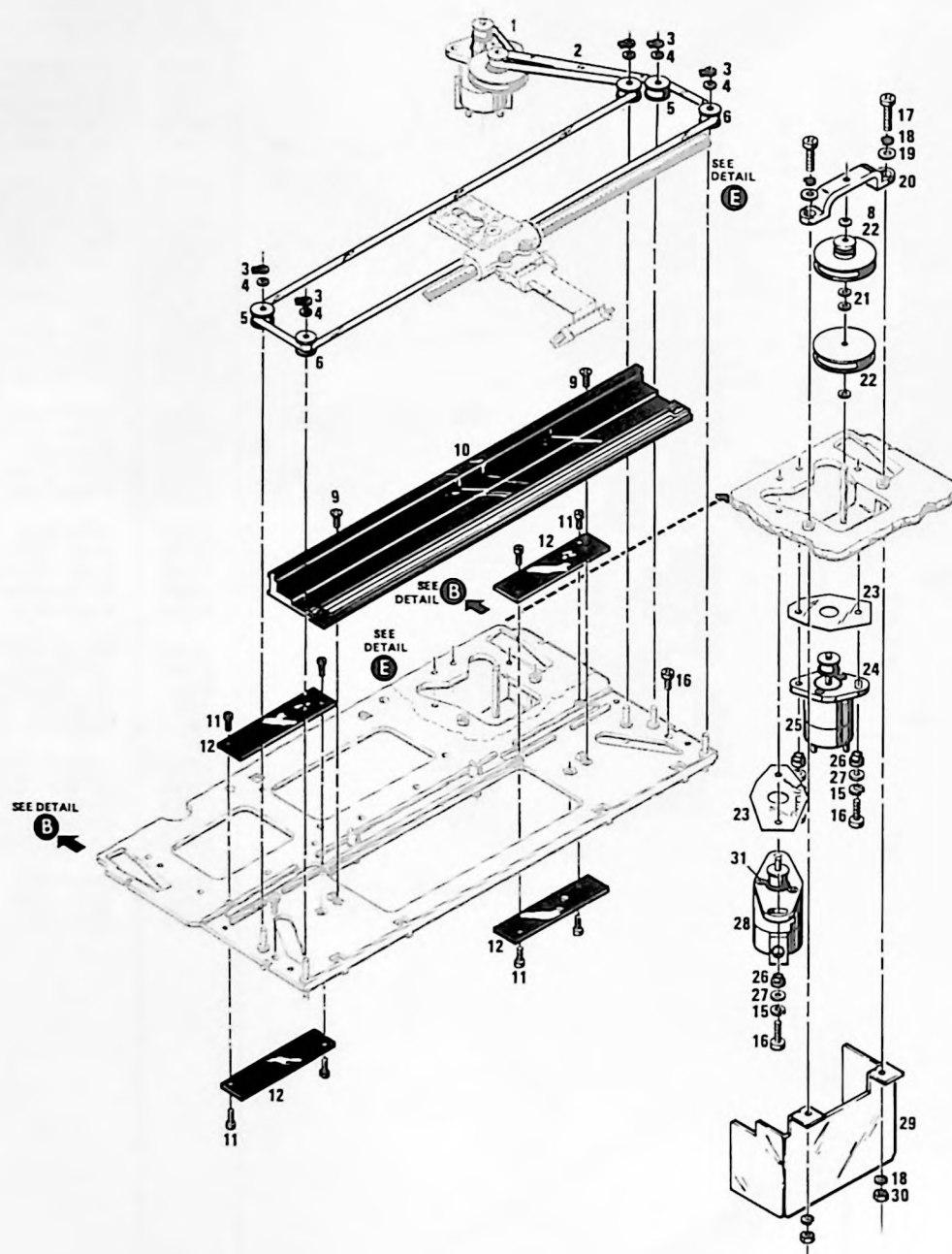
NOTE: Gray lines for reference only.

Figure 6-11. Pen Assembly, Model 7133A (Sheet 1 of 2)



Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
			DETAIL "E"		
1	07130-42200	1	SLIDE, SERVO MODULE	28480	07130-42200
2	0520-0129	1	SCREW-MACH 2-56 PAN HD POZI REC SST-300	28480	0520-0129
3	0624-0295	2	SCREW-TPG 2-56 PAN	28480	0624-0295
4	07130-02520	1	BUMPER	28480	07130-02520
5	2190-0122	1	WASHER, LOCK	00000	080
6	2190-0154	1	WASHER-FL MTLC NO. 2 .099 IN D .25 IN	28480	2190-0154
7	07130-42240	1	PINION, RATCHET	28480	07130-42240
8	07130-22140	2	ROD, SLIDER, 10-INCH	28480	07130-22140
9	07130-22160	1	BAR, PEN LIFT	28480	07130-22160
10	07130-22170	1	SCALE, MOUNT, 10-INCH	28480	07130-22170
11	07130-22200	1	SLIDE BLOCK, MACH	28480	07130-22200
12	0610-0001	1	NUT-HEX-DBL CHAM 2-56-THD .062-THK .188	28480	0610-0001
13	2190-0112	1	WASHER-LK HLCL NO. 2 .088 IN D .175 IN	28480	2190-0112
14	07130-22150	1	PIVOT, HANDLE	28480	07130-22150
15	07130-42221	1	HANDLE, MODIFIED, BLUE	28480	07130-42221
16	2200-0143	1	SCREW-MACH 4-40 PAN HD POZI REC SST-300	28480	2200-0143
17	2190-0108	1	WASHER-LK HLCL NO. 4 .115 IN D .226 IN	28480	2190-0108
18	2190-0891	1	WASHER-FL MTLC NO. 4 .125 IN D .312 IN	28480	2190-0891
19	0363-0073	1	WIPER CONTACT	00000	080
20	3050-0802	2	WASHER; DOME PL PRPHY; DOME PL PRPHY	86928	5710-7-5
21	07130-60004	1	PEN, UPPER ASSY, BLUE	28480	07130-60004
22	07130-62500	1	PEN, DISPOSABLE, BLUE	28480	07130-62500
23	2360-0229	1	SCREW-MACH 6-32 PAN HD POZI REC SST-300	28480	2360-0229
24	07130-61201	1	SERVO CONNECTOR CIRCUIT BOARD (A13)	28480	07130-61201
25	5040-4527	1	FASTENER	28480	5040-4527
26	2360-0199	1	SCREW-MACH 6-32 PAN HD POZI REC SST-300	28480	2360-0199
27	2190-0105	1	WASHER-LK HLCL NO. 6 .141 IN D .239 IN	28480	2190-0105
28	3050-0399	1	WASHER-FL MTLC NO. 6 .143 IN D .375 IN	28480	3050-0399
29	0510-0800	1	CLAMP, CABLE, .125 DIA .5 W .732 L ETH	28480	0510-0800
30	0360-0365	1	TERMINAL, SLDR LUG, 6 SCR, .143/.093 ID	78189	2104-06-00
31	07130-62100	1	ASSY, SERVO CHASSIS	28480	07130-62100
32	2420-0010	1	NUT-HEX-DBL CHAM 6-32-THD .125-THK .25	28480	2420-0010
33	07130-42290	1	BRACKET, CARTRIDGE HOLDER	28480	07130-42290
34	5060-6496	1	PIERCER VENT ASSY	28480	5060-6496
35	07143-61413	1	PIERCER, SUPPLY ASSY	28480	07143-61413
36	07130-42370	1	HOUSING, PIERCER	28480	07130-42370
37	07130-60002	1	INK CARTRIDGE, BLACK	28480	07130-60002
38	07130-02540	1	BRACKET, MOUNTING	28480	07130-02540
39	07130-22180	1	SCREW, PRIMER	28480	07130-22180
40	9301-0321	1	RUBBER SQUEEZE BULB	17405	RCDG-80-80-0011-99
41	07130-60005	1	PEN, LOWER ASSY, RED	28480	07130-60005
42	07130-62510	1	PEN, DISPOSABLE, RED	28480	07130-62510
43	0520-0130	1	SCREW-MACH 2-56 PAN HD POZI REC SST-300	28480	0520-0130
44	1600-0320	1	LEAF SPRING	28480	1600-0320
45	1600-0319	1	LEAF SPRING	28480	1600-0319

Figure 6-11. Pen Assembly, Model 7133A (Sheet 2 of 2)

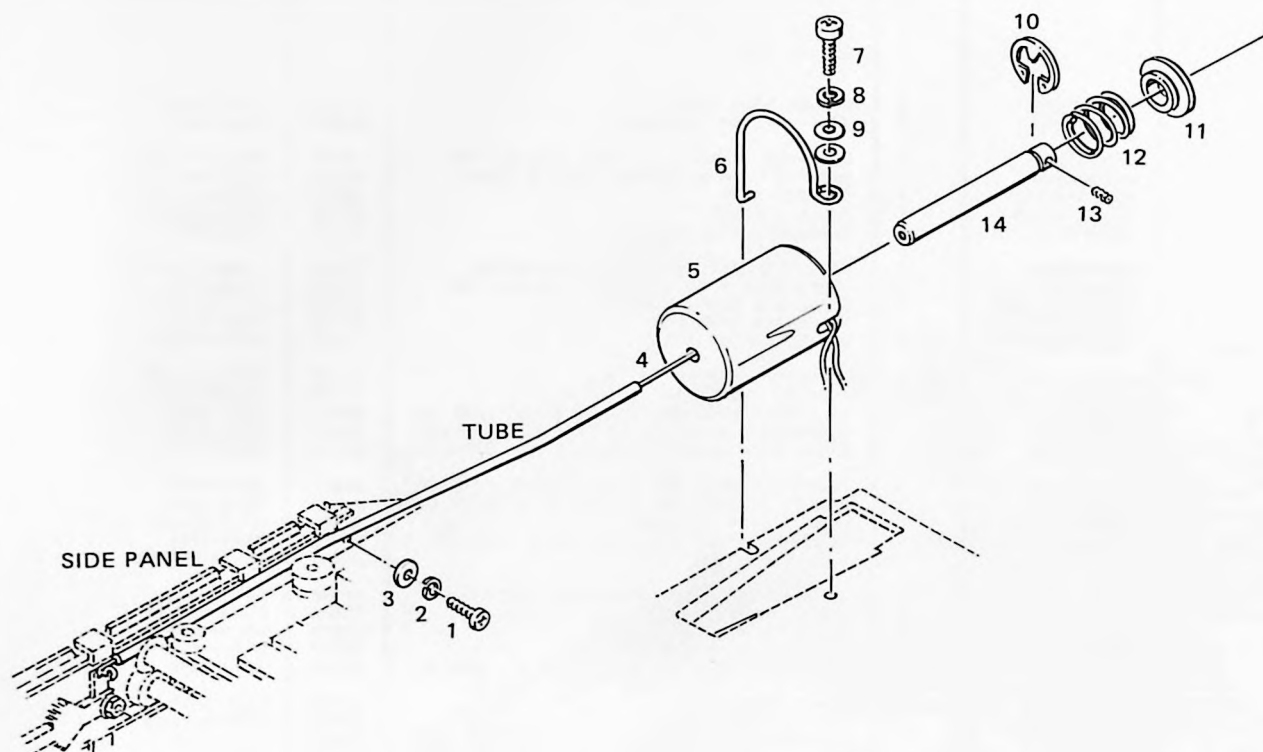
**F**

NOTE: Gray lines for reference only.

Figure 6-12. Motor Assembly, Model 7133A (Sheet 1 of 2)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
			DETAIL "F"		
1	1500-0343	1	DRIVE; BELT 5.428 L	28480	1500-0343
2	1500-0348	1	BELT, DRIVEN (38" LG)	0062P	1500-0348
3	0510-0724	1	RETAINER, RING, .094 DIA, CAD PLT STL	79136	5555-9-S-MD
4	3050-0802	1	WASHER; DOME PL PRPHY; DOME PL PRPHY	86928	5710-7-5
5	07130-22130	1	PULLEY, REAR	28480	07130-22130
6	07130-22120	1	PULLEY, FRONT	28480	07130-22120
7	0624-0206	1	SCREW-TPG 6-32 PAN	28480	0624-0206
8	0905-0481	1	SEAL "O" RING, 0.208"ID X 0.348"OD	83259	2-009-C147-70
9	2360-0181	1	SCREW-MACH 6-32 82 DEG FL HD POZI REC	28480	2360-0181
10	07130-62160	1	SLIDEWIRE ASSY, SINGLE	28480	07130-62160
11	0624-0295	1	SCREW-TPG 2-56 PAN	28480	0624-0295
12	07130-02330	1	PLATE, CABLE	28480	07130-02330
13	07130-22360	1	STANDOFF, BAFFLE	28480	07130-22360
14	07130-02410	1	BAFFLE, SLIDEWIRE	28480	07130-02410
15	2190-0108	1	WASHER-LK HLCL NO. 4 .115 IN D .226 IN	28480	2190-0108
16	2200-0143	1	SCREW-MACH 4-40 PAN HD POZI REC SST-300	28480	2200-0143
17	2360-0229	1	SCREW-MACH 6-32 PAN HD POZI REC SST-300	28480	2360-0229
18	2190-0105	1	WASHER-LK HLCL NO. 6 .141 IN D .239 IN	28480	2190-0105
19	3050-0399	1	WASHER-FL MTLC NO. 6 .143 IN D .375 IN	28480	3050-0399
20	07130-22140	1	ROD, SLIDER, 10-INCH	28480	07130-22140
21	2190-0368	1	WASHER-FL MTLC NO. 5 .13 IN D .235 IN	28480	2190-0368
22	07130-22110	1	PULLEY, DRIVEN	28480	07130-22110
23	0340-0806	1	INSULATOR; MISC; INSULATOR; .375 ID;	28480	0340-0806
24	07130-22190	1	MOTOR PLATE	28480	07130-22190
25	5060-6659	1	MOTOR ASSY	28480	5060-6659
26	07035-22430	1	WASHER, MOTOR PLATE	28480	07035-22430
27	2190-0376	1	WASHER-FL MTLC NO. 4 .115 IN D .209 IN	28480	2190-0376
28	5060-6660	1	MOTOR ASSY	28480	5060-6660
29	07130-02400	1	BAFFLE, MOTOR	28480	07130-02400
30	2420-0010	1	NUT-HEX-DBL CHAM 6-32-THD .125-THK .25	28480	2420-0010
31	2200-0140	1	SCREW-MACH 4-40 100 DEG FL HD POZI REC	28480	2200-0140

Figure 6-12. Motor Assembly, Model 7133A (Sheet 2 of 2)

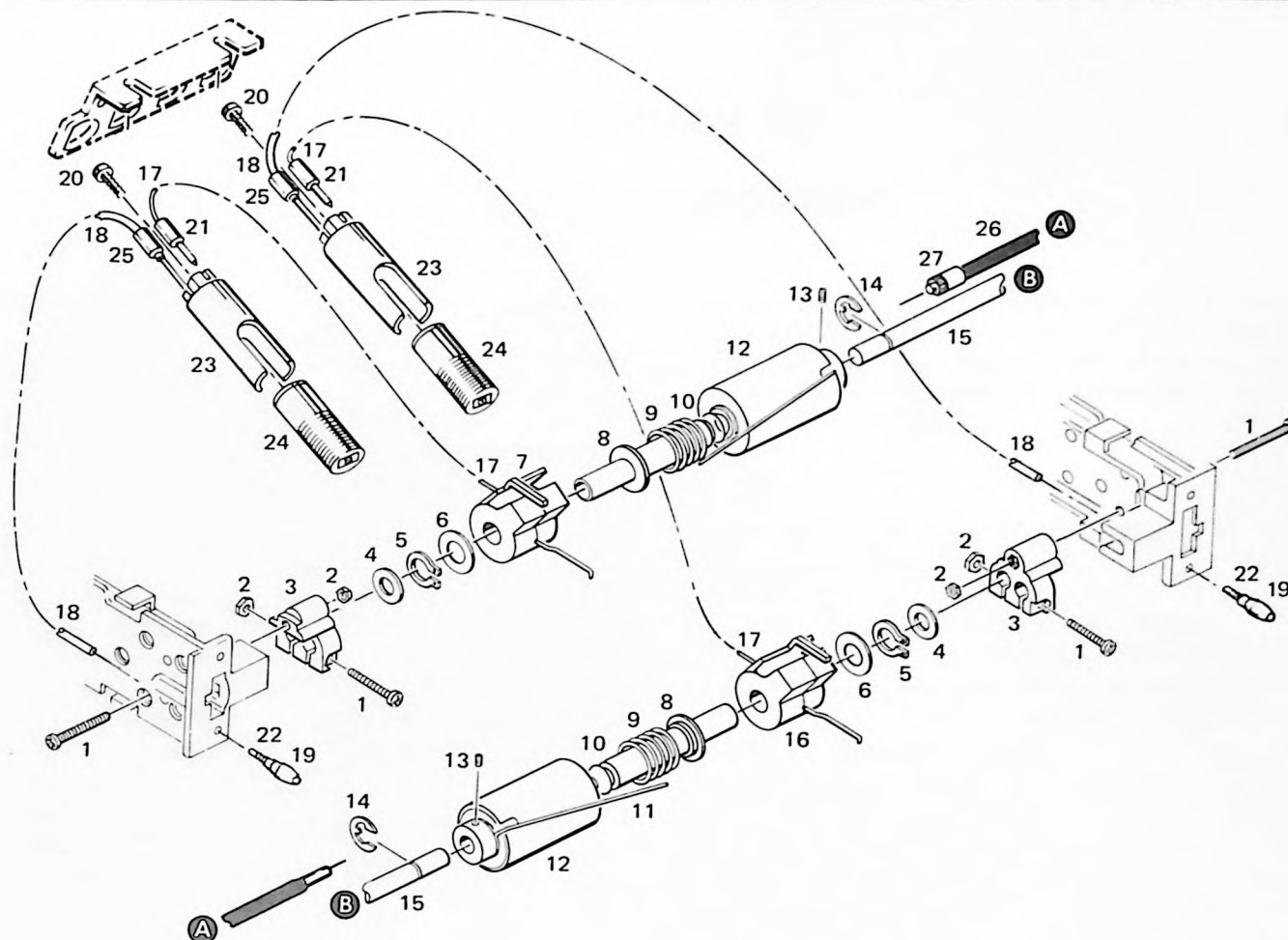


NOTE: SPECIAL SIDE PANEL AND TUBE COMPRISE STOCKED ASSEMBLY 07130-62370 (TUBE IS PRESSED INTO A TIGHT GROOVE).

<u>Item</u>	<u>Part Number</u>	<u>Description</u>	<u>Manufacturer</u>
1	0520-0155	Screw, Mach, Pozidriv, 2-56 x 1/8	Pheoll Mfg. Co.
2	2190-0112	Washer, Lock	National Lockwasher Co.
3	2190-0154	Washer, Flat	A. Corland Co.
4	1460-1364	Wire Form	Conner Spring & Mfg. Co.
5	07130-62190	Solenoid Assembly — Pen	Hewlett-Packard
6	1460-1359	Wire Form	Superior Spring Co.
7	2200-0143	Screw, Mach, Pozidriv, 4-40 x 3/8	Hewlett-Packard
8	2190-0108	Washer, Lock	National Lockwasher Co.
9	3050-0398	Washer, Flat, Metallic	Seastrom Mfg. Co.
10	0510-0083	Ring, Retaining	Waldes-Kohinoor, Inc.
11	2190-0336	Washer, Shoulder	Weckesser Co.
12	1460-1188	Spring, Compression	Superior Spring Co.
13	3030-0057	Screw, Set, 2-56 x 3/32	Allen Mfg. Co.
14	07130-22270	Plunger	Hewlett-Packard

Figure 6-13. Remote Pen Lift, Models 7132A, 7133A





Item	Part Number	Description	Manufacturer
1	0520-0134	Screw, Mach, Pozidriv, 2-56 x 9/16	Hewlett-Packard
2	0610-0001	Nut, Hex, 2-56	Federal Screw Products Co.
3	07130-42320	Yoke, Rod	Hewlett-Packard
4	2190-0303	Washer, Fiber	Empire Co.
5	0510-0054	Ring, Retaining	Waldes-Kohinoor, Inc.
6	2190-0470	Washer, Flat	Switchcraft
7	07130-62260	Block Event Assembly, L.H.	Hewlett-Packard
8	07130-22320	Plunger - Event	Hewlett-Packard
9	1460-0591	Spring, Compression	Superior Spring Co.
10	07130-22450	Conical, Spacer	Hewlett-Packard
11	1460-1347	Wire Form	Superior Spring Co.
12	07130-62280	Solenoid Event Assembly	Hewlett-Packard
13	0570-0142	Screw, Set, 2-56 x 1/8	The Bristol Co.
14	0510-0045	Ring, Retaining	Waldes-Kohinoor, Inc.
15	07130-22300	Rod, Event	Hewlett-Packard
16	07130-62250	Block Event Assembly, R.H.	Hewlett-Packard
17	0890-0584	1 ft .0341 D Tube, Flex	Hewlett-Packard
18	0890-1087	1 ft .0611 D Tube, Flex	Hewlett-Packard
19	9301-0321	Bulb, Rubber	Hewlett-Packard
20	2360-0195	Screw, 6-32 x .31	Hewlett-Packard
21	5060-6496	Piercer Vent Assembly	Hewlett-Packard
22	07130-22180	Screw Primer	Hewlett-Packard
23	07130-42370	Housing, Piercer	Hewlett-Packard
24	07130-60002	Ink Cartridge, Black	Hewlett-Packard
25	07143-61413	Piercer Supply Assembly	Hewlett-Packard
26	07130-22160	Bar, Pen Lift (Lwr Chan & Event Mkr)	Hewlett-Packard
27	07130-42260	Pinion, Pen Lift (Lwr Chan & Event Mkr)	Hewlett-Packard

Figure 6-14. Event Marker Models 7132A, 7133A (Options 037/537)



## **SECTION VII**

### **TROUBLESHOOTING**

#### **7-1. INTRODUCTION.**

#### **7-2. CONTENT.**

7-3. This section contains instructions for troubleshooting the 7132A and 7133A. Component location photographs, schematics, and troubleshooting table are supplied to aid in troubleshooting.

#### **7-4. TROUBLESHOOTING.**

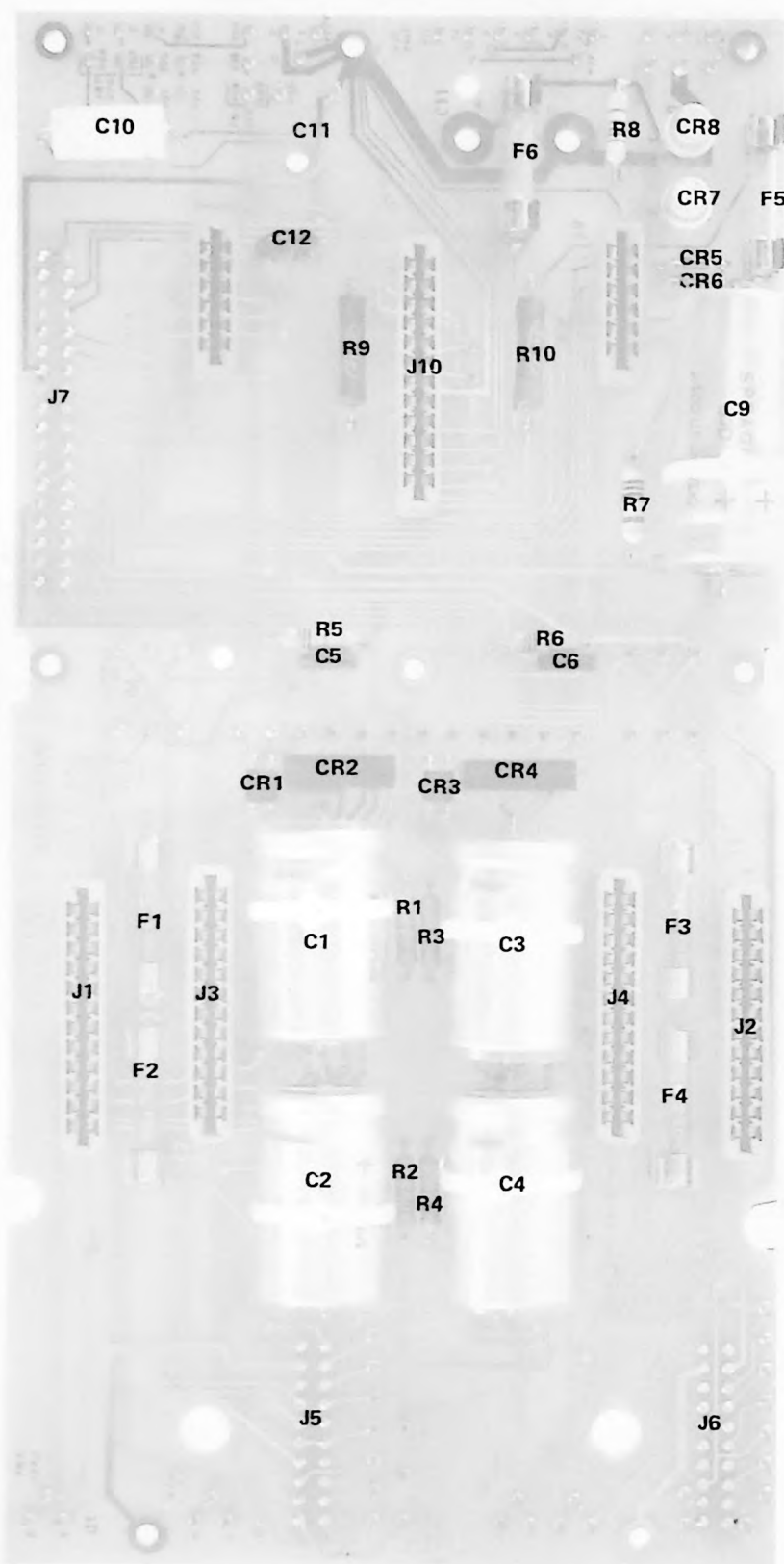
#### **7-5. REQUIREMENTS.**

7-6. Troubleshooting should be performed in a logical manner. The concept of bracketing should be established, such as determining which circuits or sections

are not operating or are operating abnormally. This is generally the fastest method to locate trouble in a closed loop circuit. When troubleshooting, utilize the photographs and schematics presented in this section, Figure 7-1 through 7-16.

#### **7-7. TROUBLESHOOTING INDEX.**

7-8. The troubleshooting index, Tables 7-1 (7132A) and 7-2 (7133A) lists other possible malfunctions, suspected reasons, and remedies. Use component location photographs and schematics for backup when searching out problem area.



Reference Designation	HP Part Number
A1	07130-61870
A1C1	0180-J334
A1C2	0180-0334
A1C3	0180-0334
A1C4	0180-0335
A1C5	0160-0174
A1C6	0160-0174
A1C9	0180-2240
A1C10	0160-3390
A1C11	0180-2497
A1C12	0160-0012
A1CR1	1901-0363
A1CR2	1901-0638
A1CR3	1901-0363
A1CR4	1901-0638
A1CR5	1901-0159
A1CR6	1901-0159
A1CR7	15C1-0416
A1CR8	1901-U418
A1F1	2110-0304
A1F2	2110-0304
A1F3	2110-0304
A1F4	2110-0304
A1F5	2110-0063
A1F6	2110-0043
A1J1	1251-1626
A1J2	1251-1626
A1J3	1251-1626
A1J4	1251-1626
A1J5	1251-2034
A1J6	1251-2034
A1J7	1251-2026
A1J10	1251-1626
A1R1	0757-0833
A1R2	0757-0833
A1R3	0757-0833
A1R4	0757-0833
A1R5	0757-0984
A1R6	0757-0984
A1R7	0757-0824
A1R8	0757-0839
A1R9	0812-0046
A1R10	0812-0046
A1XF1	2110-0269
	1400-0482
	5020-0495

Figure 7-1. Mother Board, Model 7132A



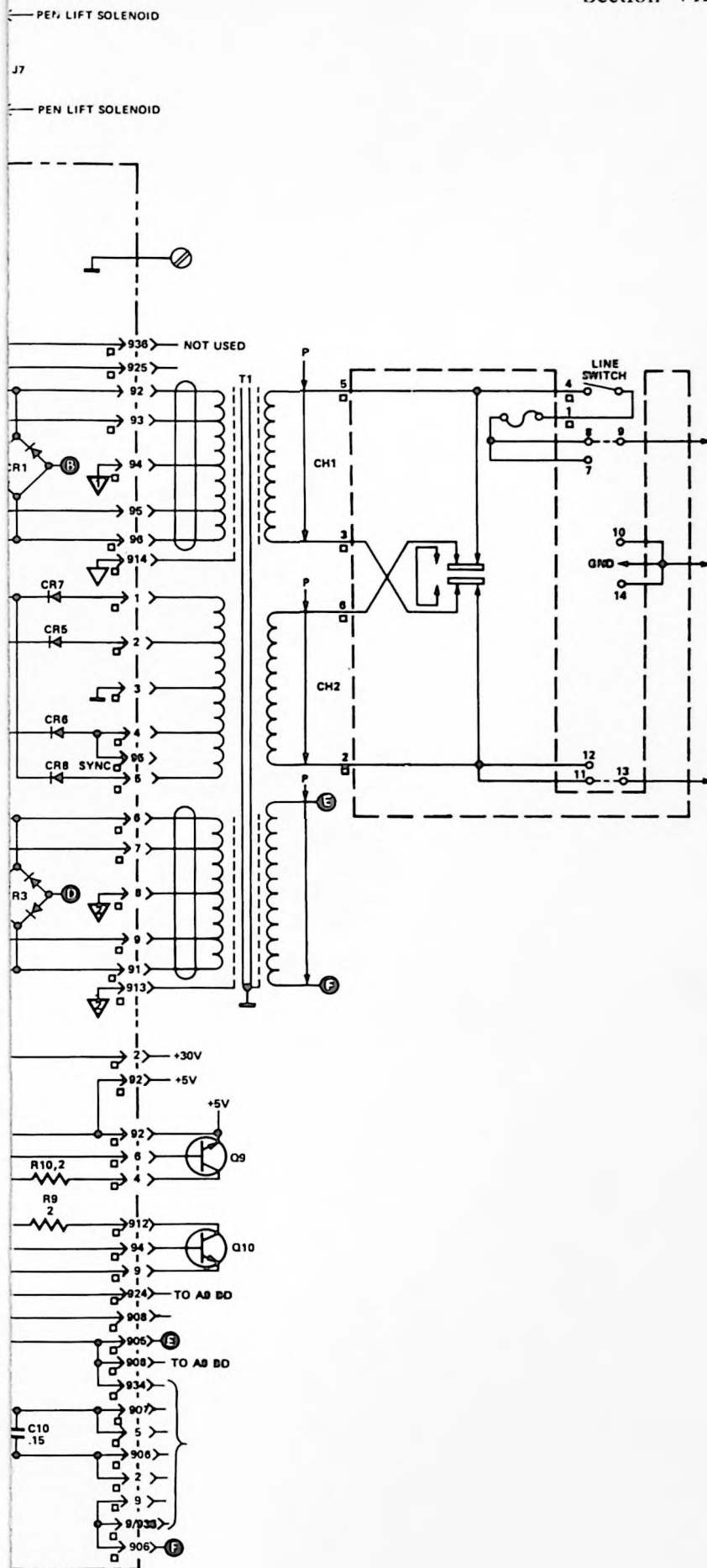
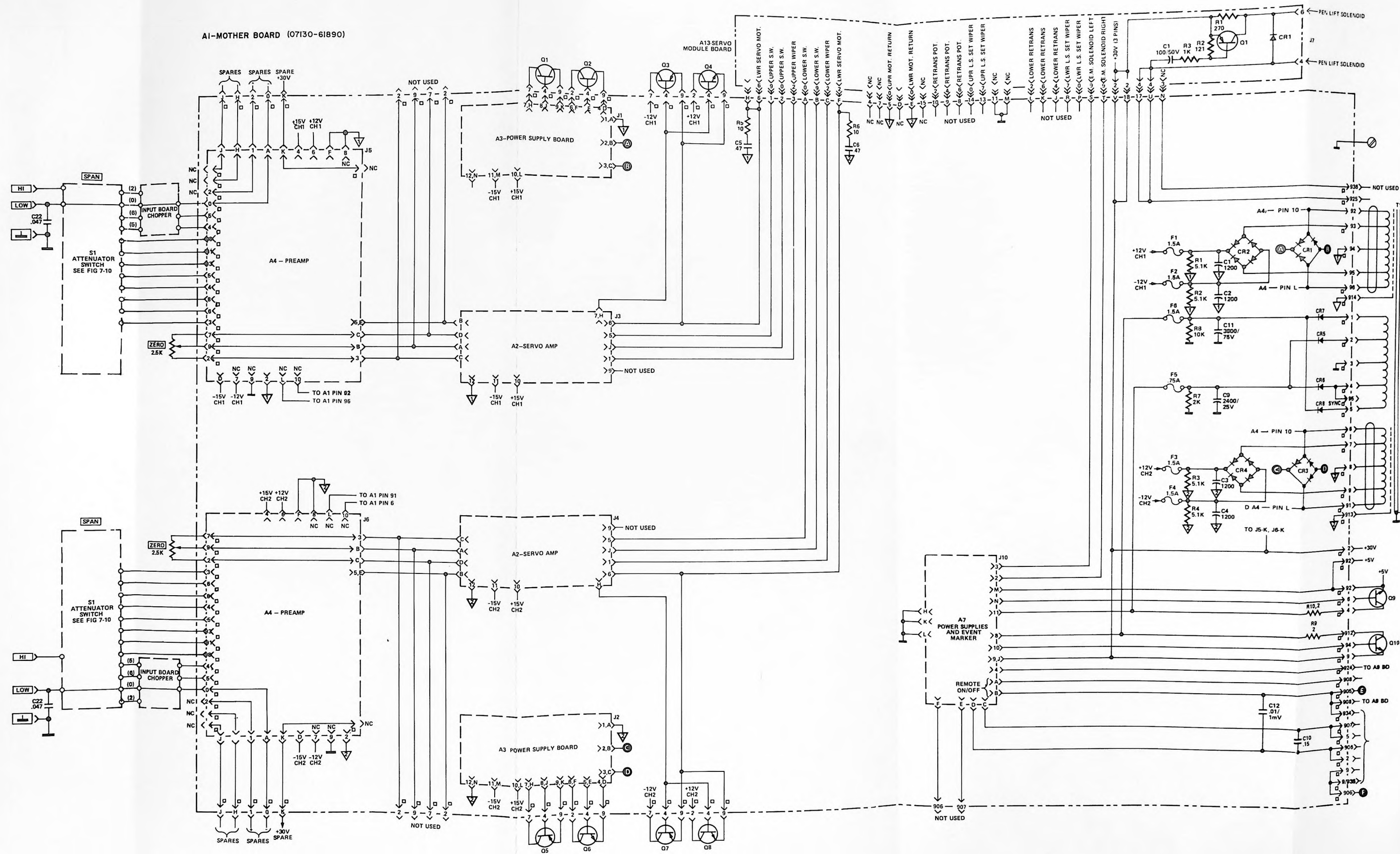


Figure 7-2. Mother Board Schematic, Model 7132A



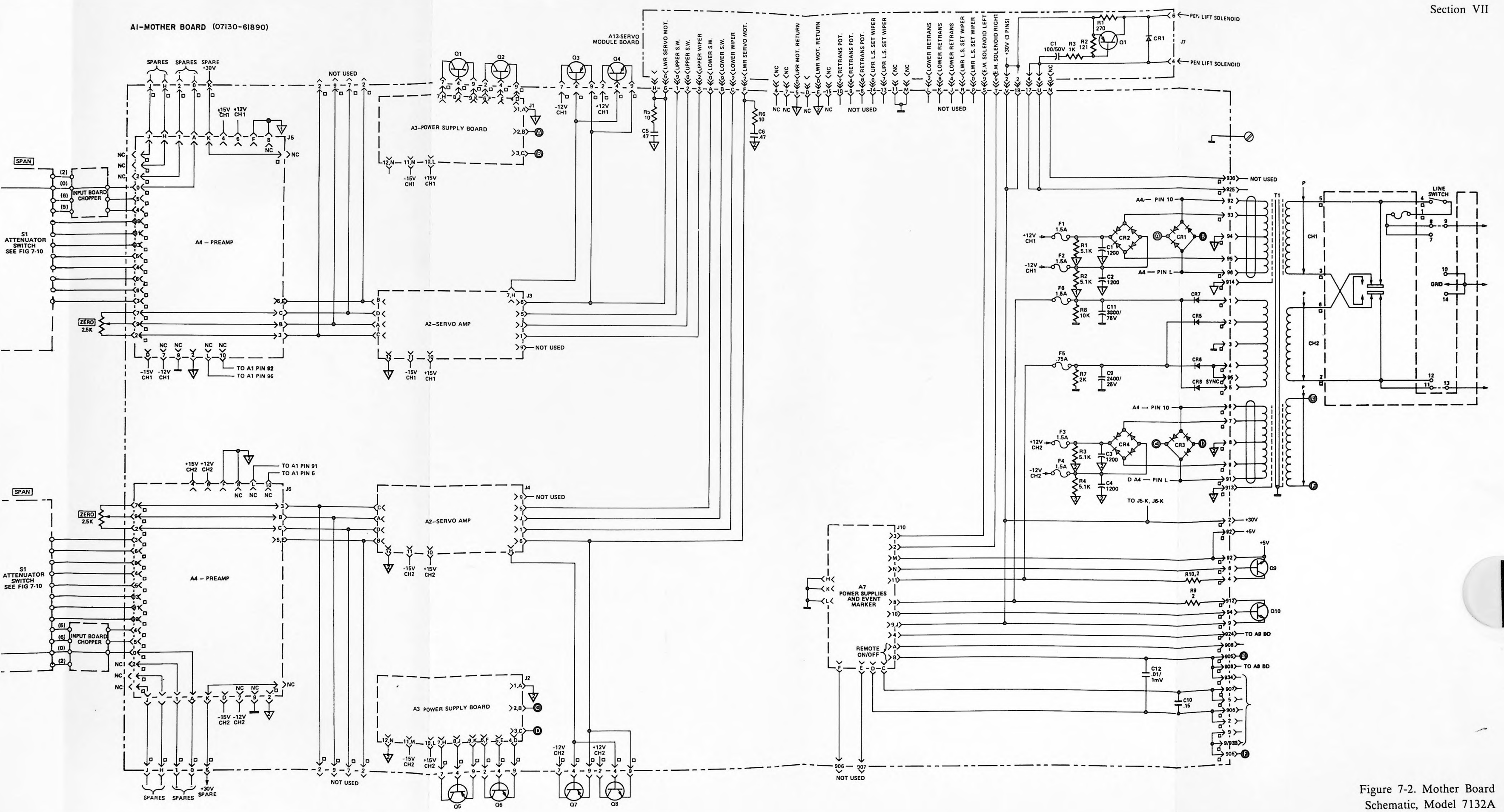
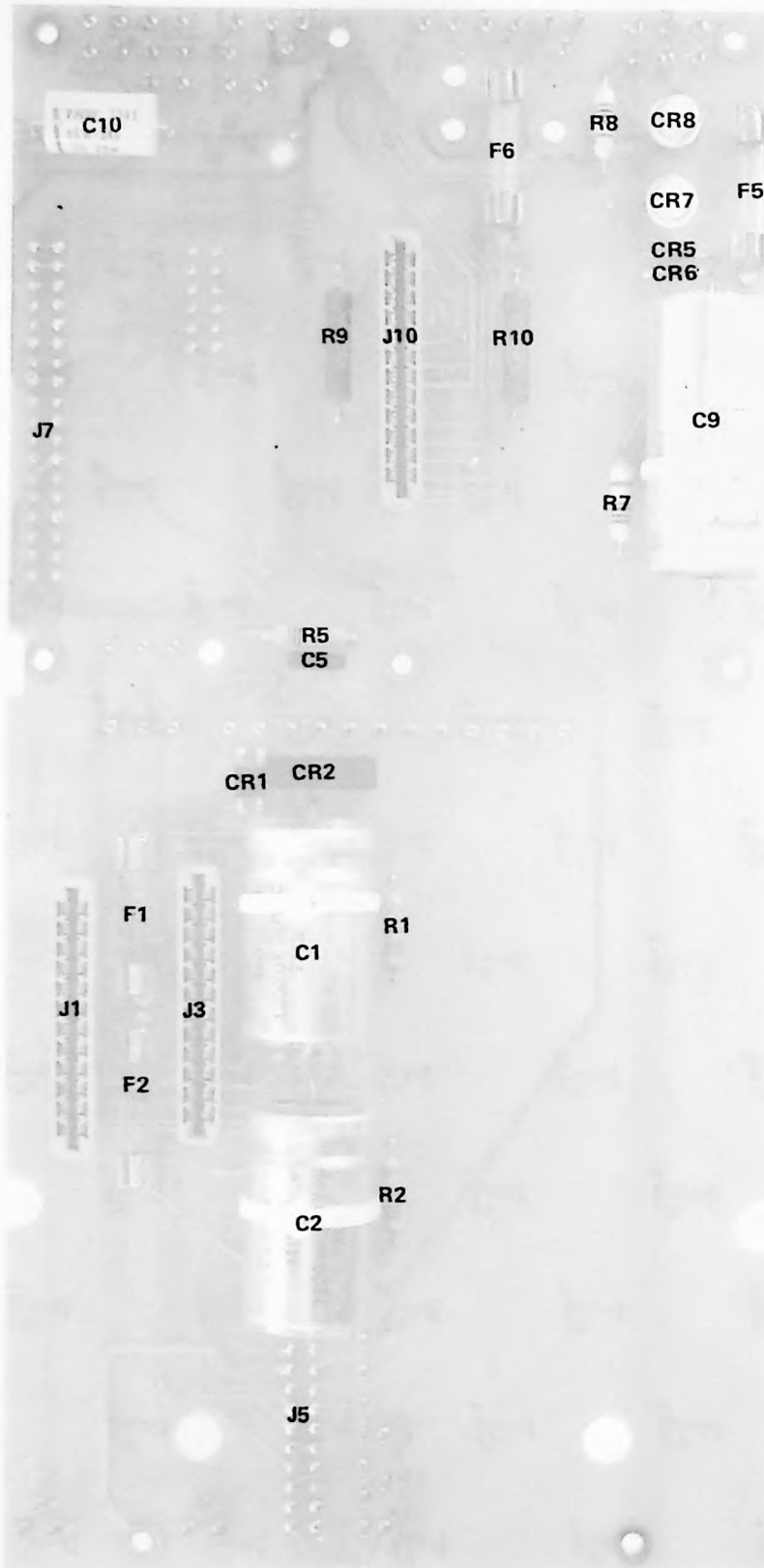


Figure 7-2. Mother Board Schematic, Model 7132A





Reference Designation	HP Part Number
A1	07131-60115
A1C1	0180-0334
A1C2	0180-0334
A1C5	0160-0174
A1C9	0180-2240
A1C10	0160-3390
A1C11	0180-2457
A1CR1	1901-0363
A1CR2	1901-0638
A1CR5	1901-0159
A1CR6	1901-0159
A1CR7	1901-0418
A1CR8	1901-0418
A1F1	2110-0304
A1F2	2110-0304
A1F5	2110-0063
A1F6	2110-0043
A1J1	1251-1626
A1J3	1251-1626
A1J5	1251-2034
A1J7	1251-2026
A1J10	1251-1626
A1R1	0757-0833
A1R2	0757-0833
A1R5	0757-0984
A1R7	0757-0824
A1R8	0757-0839
A1R9	0812-0046
A1R10	0812-0046
A1XF1	2110-0269
A1Z	1400-0462
	1400-0482
	5020-0495

Figure 7-3. Mother Board, Model 7133A



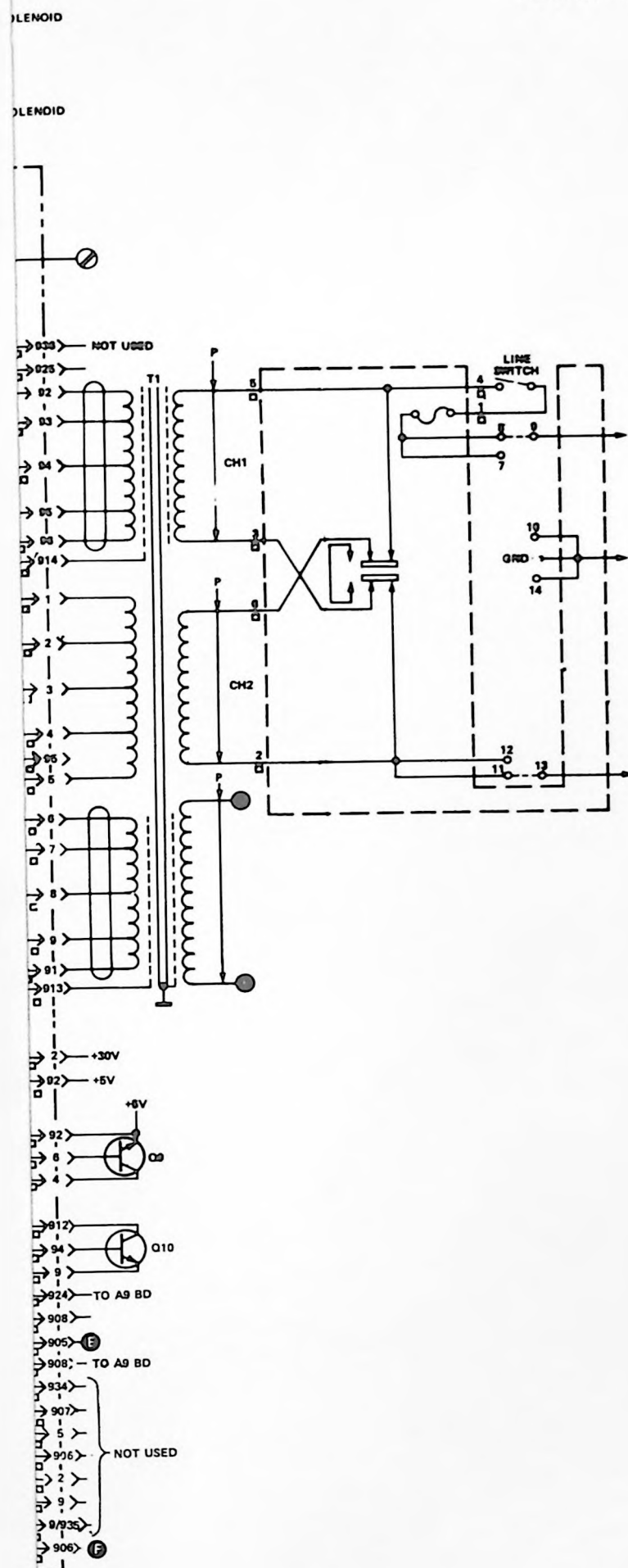


Figure 7-4. Mother Board Schematic, Model 7133A

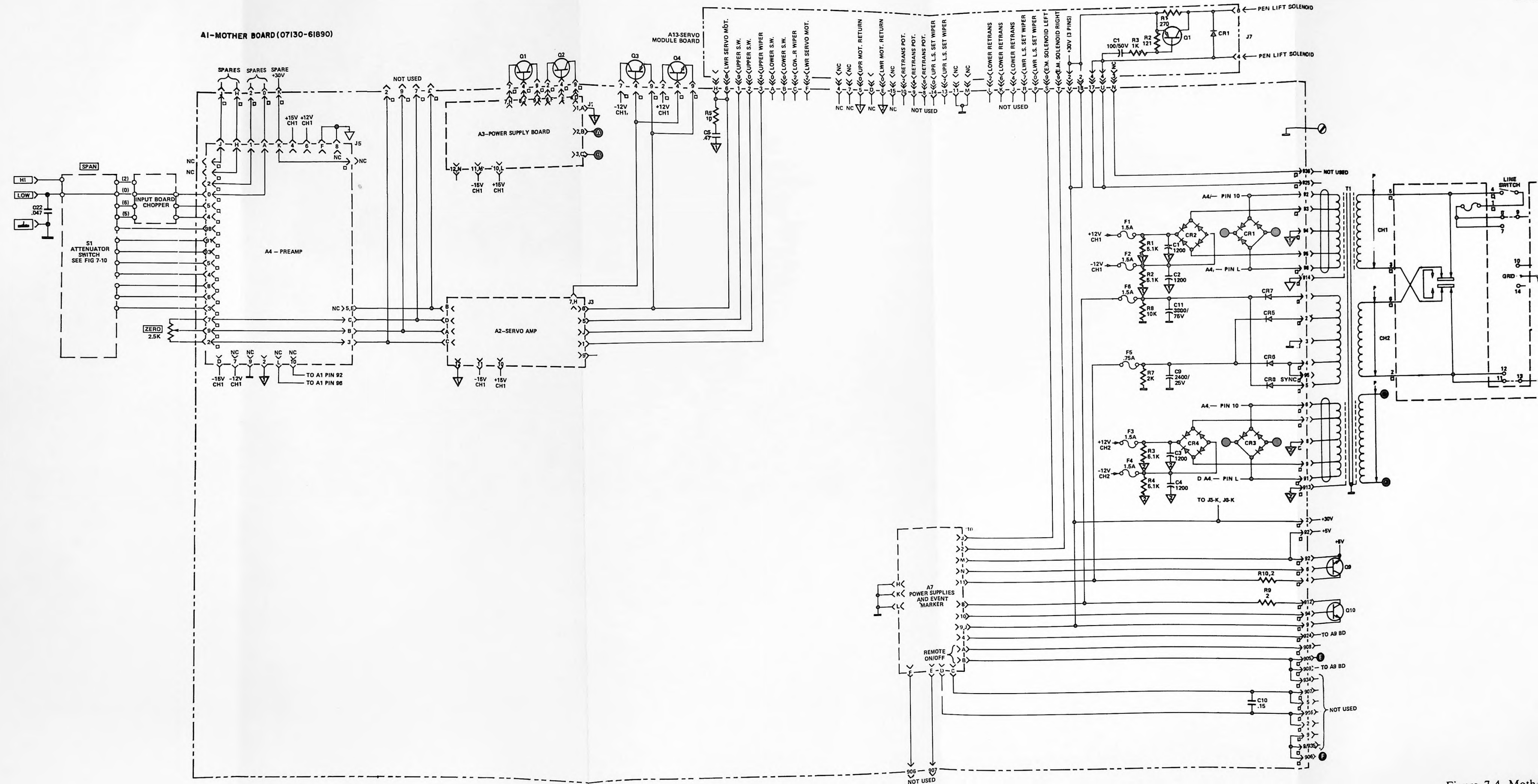
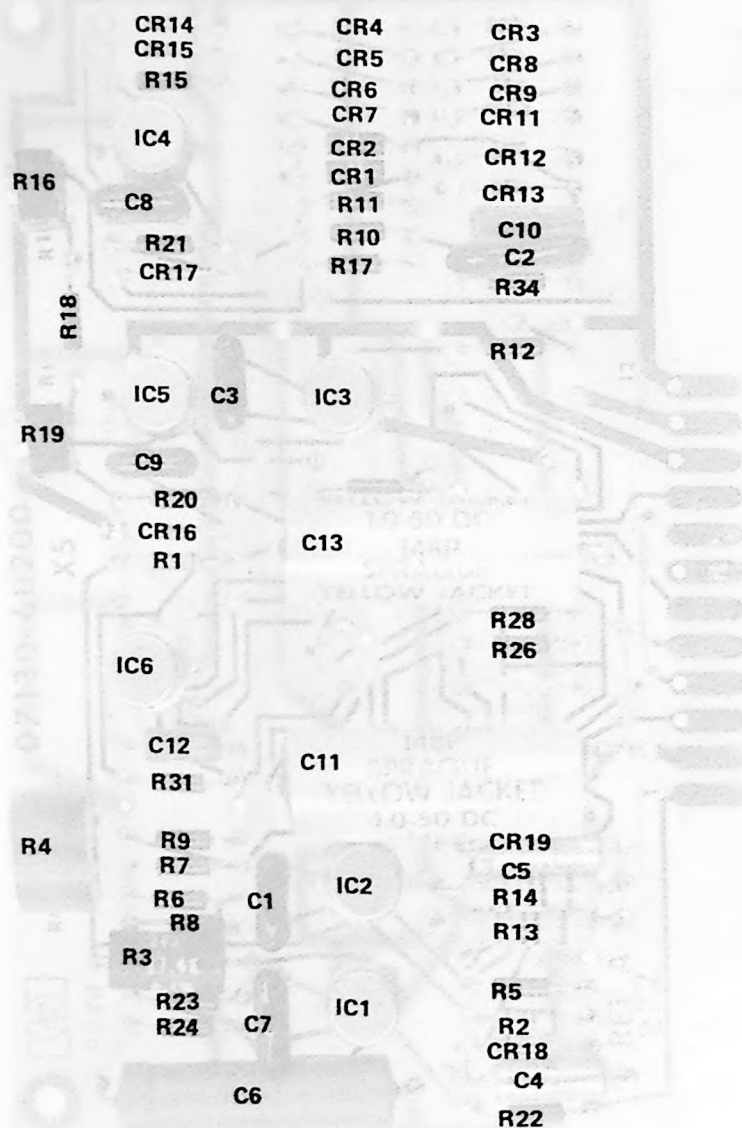


Figure 7-4. Mother Board Schematic, Mod



7-5



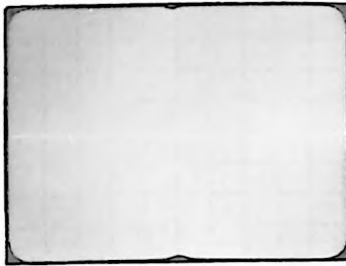


Reference Designation	HP Part Number
A2	07130-60200
A2C1	0160-2199
A2C2	0160-2211
A2C3	0160-2204
A2C4	0180-0229
A2C5	0180-0229
A2C6	0160-3387
A2C7	0160-2204
A2C8	0160-2204
A2C9	0160-2204
A2C10	0160-0174
A2C11	0160-0859
A2C12	0160-0297
A2C13	0160-0859
A2CR1	1902-3149
A2CR2	1902-3149
A2CR3	1901-0033
A2CR4	1901-0033
A2CR5	1901-0033
A2CR6	1901-0033
A2CR7	1901-0033
A2CR8	1901-0033
A2CR9	1901-0033
A2CR11	1901-0033
A2CR12	1901-0033
A2CR13	1901-0033
A2CR14	1901-0040
A2CR15	1901-0040
A2CR16	1901-0040
A2CR17	1901-0040
A2CR18	1902-0777
A2CR19	1902-0777
A2IC1	1820-0223
A2IC2	1820-0223
A2IC3	1820-0223
A2IC4	1820-0223
A2IC5	1820-0223
A2IC6	1820-0223
A2R1	0698-0092
A2R2	0698-7879
A2R3	0811-2611
A2R4	2100-1757
A2R5	0698-0085
A2R6	0698-3158
A2R7	0698-3162
A2R8	0757-0280
A2R9	0698-3449
A2R10	0757-0416
A2R11	0698-3161
A2R12	0757-0416
A2R13	0757-0815
A2R14	0757-0815
A2R15	0757-0465
A2R16	2100-3350
A2R17	0757-0284
A2R18	0757-0443
A2R19	2100-3350
A2R20	0757-0284
A2R21	0757-0465
A2R22	0757-0401
A2R23	0757-0199
A2R24	0757-0439
A2R26	0698-3157
A2R28	0698-3157
A2R31	0698-3161
A2R33	0757-0401
A2R34	0698-3457

Figure 7-5. Servo Amplifier Board, Models 7132A, 7133A



WF1



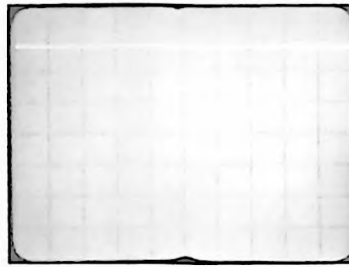
SCOPE

5 V/DIV  
2 MSEC/DIV  
DC MODE  
(VERTICAL  
CENTERED)

RECORDER

INPUTS SHORTED  
SERVO MUTED  
AGAINST RH SIDE

WF2



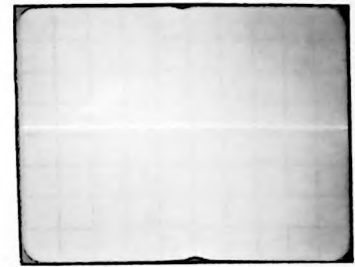
SCOPE

5 V/DIV  
2 MSEC/DIV  
DC MODE  
(VERTICAL  
CENTERED)

RECORDER

INPUTS SHORTED  
SERVO NOT MUTED  
(DRIVING)  
BY ADJ ZERO  
CONTROL CW

WF3



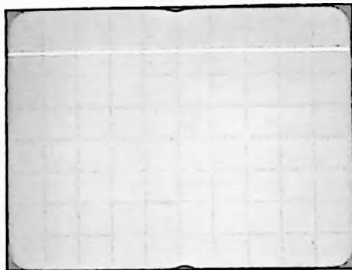
SCOPE

5 V/DIV  
2 MSEC/DIV  
DC MODE  
(VERTICAL  
CENTERED)

RECORDER

INPUTS SHORTED  
SERVO MUTED  
ZERO CONTROL  
TO LEFT

WF4



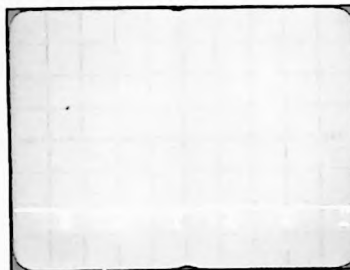
SCOPE

5 V/DIV  
2 MSEC/DIV  
DC MODE  
(VERTICAL  
CENTERED)

RECORDER

INPUTS SHORTED  
SERVO NOT MUTED  
ZERO CONTROL  
TO LEFT

WF5



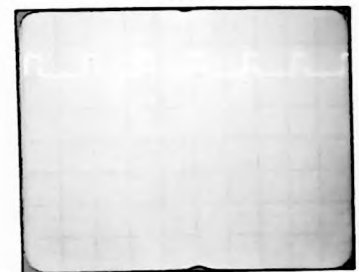
SCOPE

5 V/DIV  
5 MSEC  
DC MODE  
(VERTICAL  
CENTERED)

RECORDER

INPUTS SHORTED  
SERVO NOT MUTED  
ZERO CONTROL  
TO LEFT

WF6



SCOPE

5 V/DIV  
5 MSEC  
DC MODE  
(VERTICAL  
CENTERED)

RECORDER

INPUTS SHORTED  
SERVO NOT MUTED  
ZERO CONTROL  
TO RIGHT

WF7



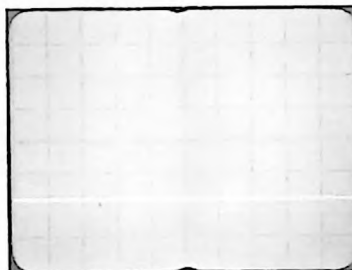
SCOPE

5 V/DIV  
5 MSEC  
DC MODE  
(VERTICAL  
CENTERED)

RECORDER

INPUTS SHORTED  
SERVO NOT MUTED  
ZERO CONTROL  
TO RIGHT

WF8



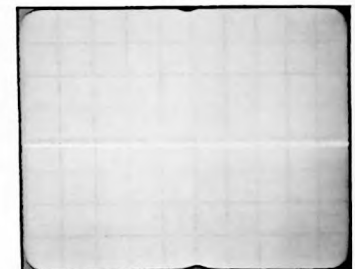
SCOPE

5 V/DIV  
5 MSEC  
DC MODE  
(VERTICAL  
CENTERED)

RECORDER

INPUTS SHORTED  
SERVO NOT MUTED  
ZERO CONTROL  
TO LEFT

WF9



SCOPE

.5 V/DIV  
5 MSEC

RECORDER

INPUTS SHORTED  
ZERO FULLY CCW  
NOT MUTED

WF10



SCOPE

.5 V/DIV  
5 MSEC

RECORDER

INPUTS SHORTED  
ZERO FULLY CW  
NOT MUTED

WF11



SCOPE

.5 V/DIV  
5 MSEC

RECORDER

INPUTS SHORTED  
ZERO FULLY CW  
NOT MUTED

WF12



SCOPE

.5 V/DIV  
5 MSEC

RECORDER

INPUTS SHORTED  
ZERO FULLY CCW  
NOT MUTED

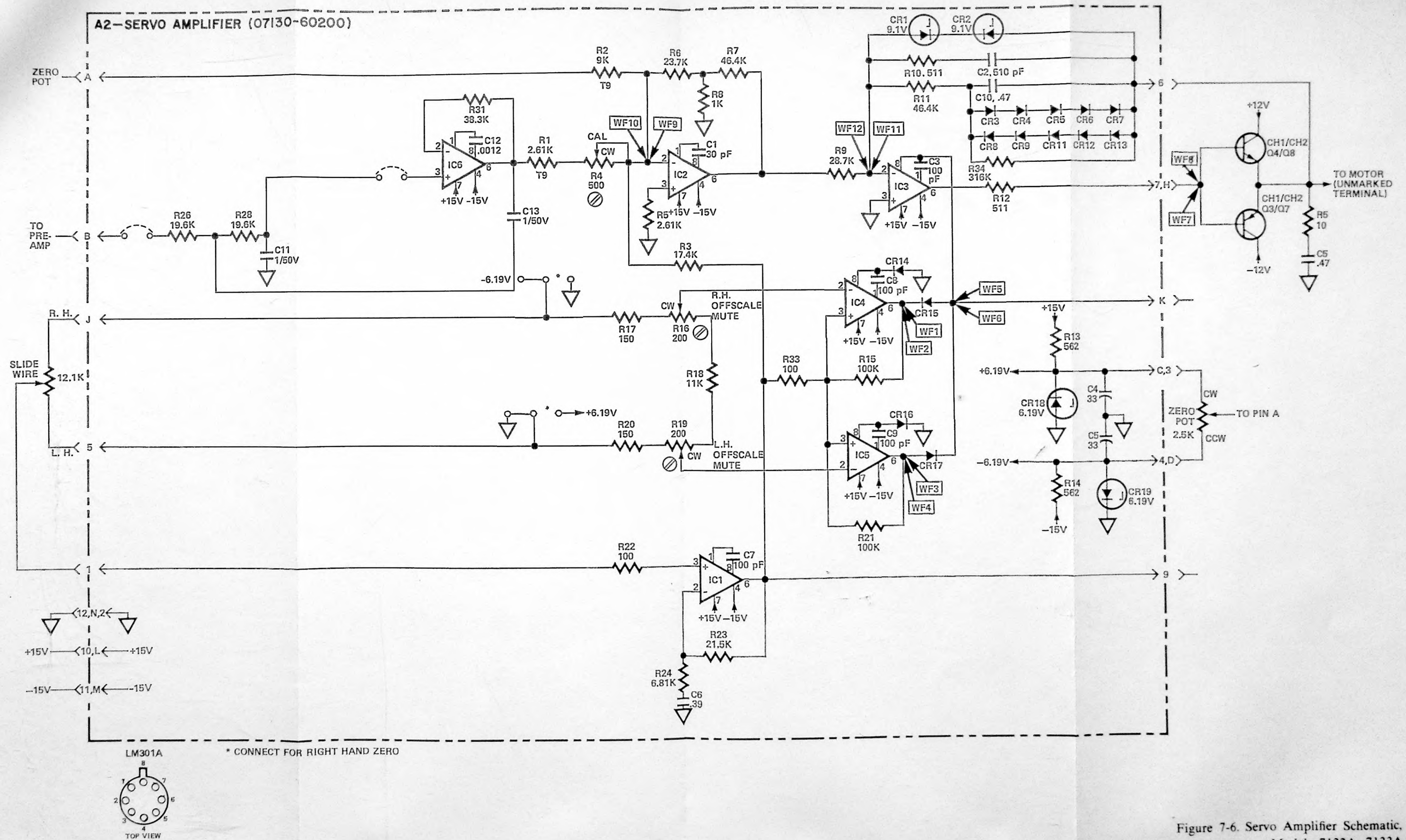
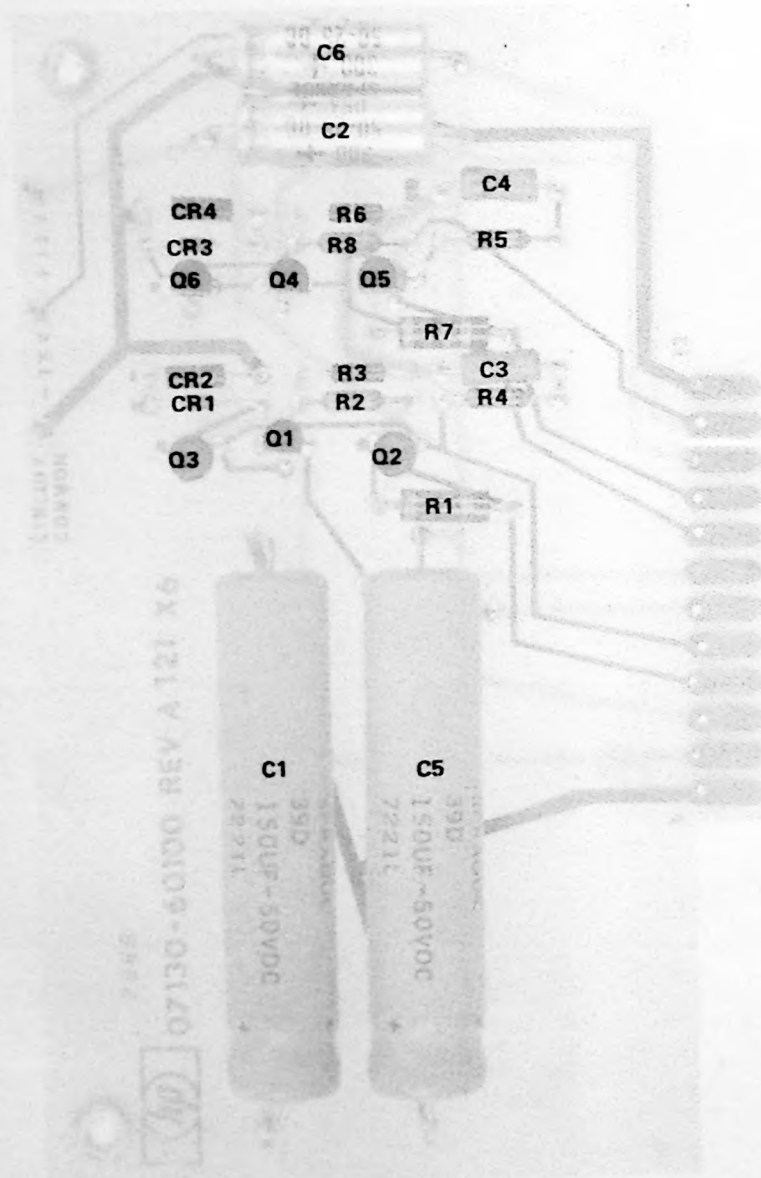


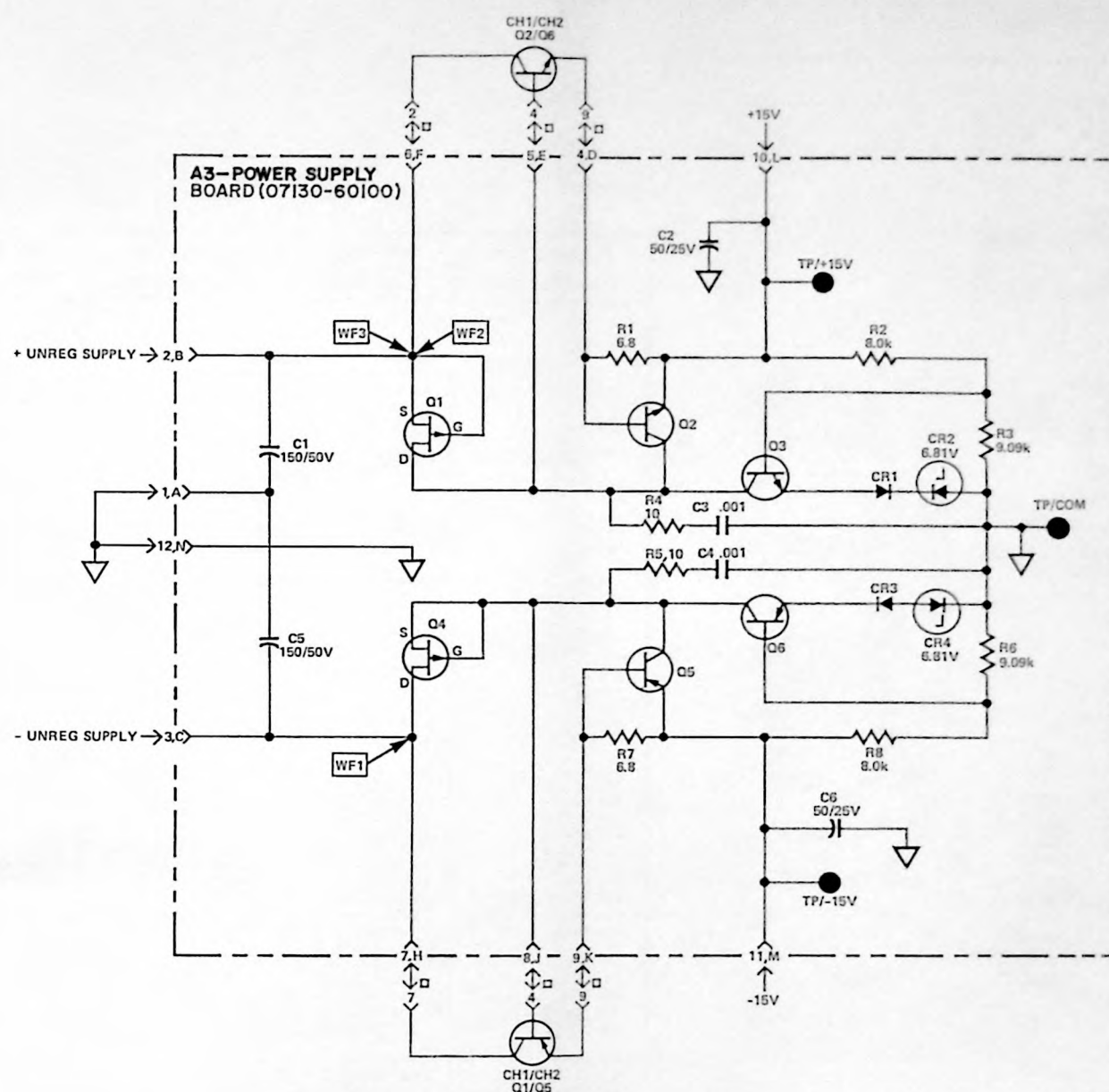
Figure 7-6. Servo Amplifier Schematic, Models 7132A, 7133A



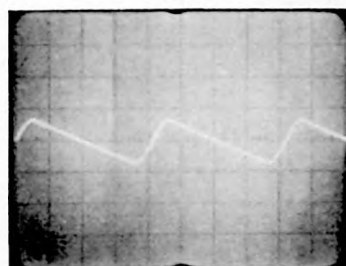


Reference Designation	HP Part Number
A3	07130-60100
A3C1	0180-2493
A3C2	0180-0058
A3C3	0160-0153
A3C4	0160-0153
A3C5	0180-2493
A3C6	0180-0058
A3CR1	1901-0022
A3CR2	1902-0048
A3CR3	1901-0022
A3CR4	1902-0048
A3Q1	1855-0362
A3Q2	1854-0087
A3Q3	1854-0087
A3Q4	1855-0362
A3Q5	1853-0086
A3Q6	1853-0086
A3R1	0698-5525
A3R2	0698-3200
A3R3	0757-0288
A3R4	0757-0346
A3R5	0757-0346
A3R6	0757-0288
A3R7	0698-5525
A3R8	0698-3200

Figure 7-7. Power Supply Board, Models 7132A, 7133A



WF1



SCOPE  
1 V/DIV  
2 MSEC  
AC MODE

WF2



SCOPE  
10 V/DIV  
10 MSEC/DIV  
DC MODE

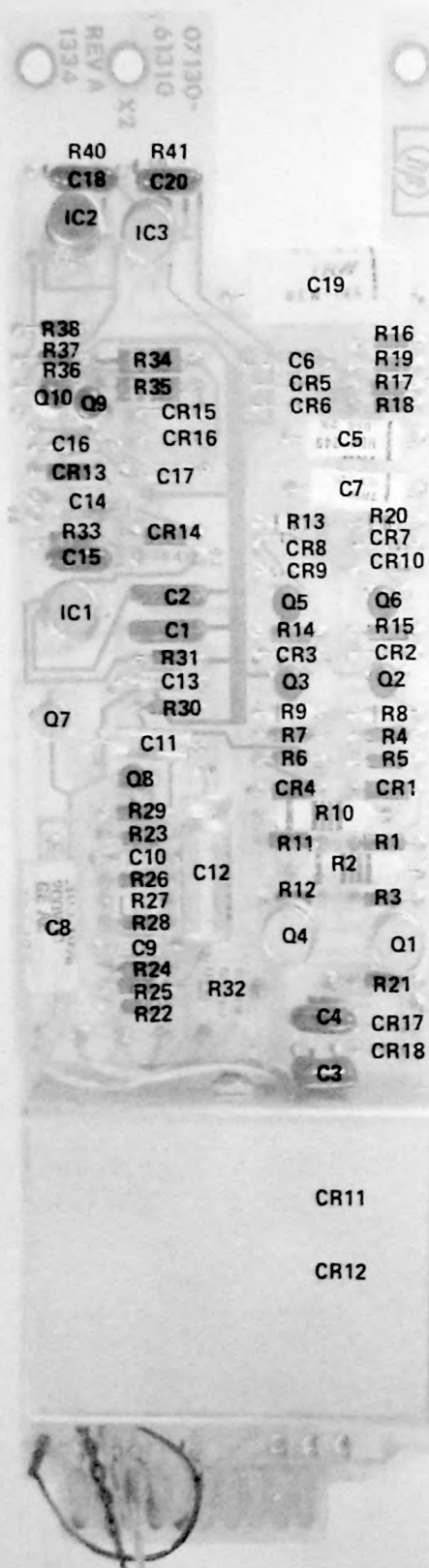
WF3



SCOPE  
10 V/DIV  
10 MSEC/DIV  
DC MODE

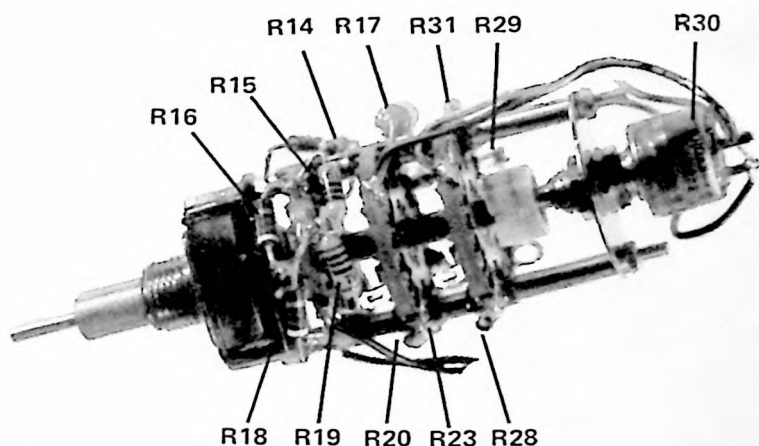
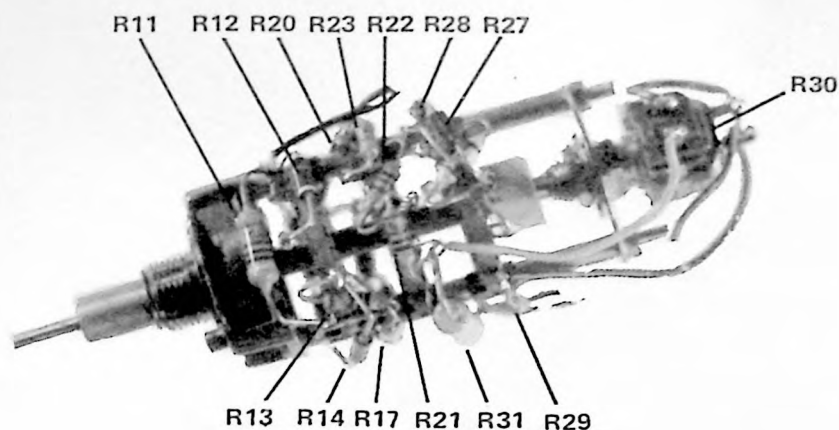
Figure 7-8. Power Supply Schematic Models 7132A, 7133A





Reference Designation	HP Part Number	Reference Designation	HP Part Number
A4	07130-61310	A4C6	1854-0087
A4C1	0150-0121	A4C7	5081-5004
A4C2	0150-0121	A4C8	1853-0066
A4C3	0160-0205	A4C5	1855-0062
A4C4	0160-0205	A4C10	1855-0062
A4C5	0160-3532	A4F1	0757-0465
A4C6	0180-0195	A4F2	0698-3399
A4C7	0160-3532	A4F3	0757-0469
A4C8	0160-0168	A4F4	0757-0283
A4C9	0180-0197	A4F5	0757-0469
A4C10	0180-0291	A4F6	0757-0469
A4C11	0180-0116	A4F7	0757-0283
A4C12	0180-0058	A4F8	0698-3260
A4C13	0180-0197	A4F9	0698-3260
A4C14	0180-0106	A4F10	0698-3399
A4C15	0160-2199	A4K11	0757-0465
A4C16	0180-0197	A4K12	0757-0469
A4C17	0180-0197	A4K13	0757-0459
A4C18	0160-2204	A4K14	0757-0465
A4C19	0160-3518	A4K15	0757-0465
A4C20	0160-2204	A4K16	0757-0442
A4CR1	1902-0049	A4K17	0757-0442
A4CR2	1901-0040	A4K18	0757-0442
A4CR3	1901-0040	A4K19	0757-0442
A4CR4	1902-0049	A4K20	0757-0459
A4CR5	1901-0040	A4K21	0757-0440
A4CR6	1901-0040	A4K22	0698-3162
A4CR7	1901-0040	A4K23	0698-3162
A4CR8	1901-0040	A4K24	0757-0449
A4CR9	1901-0040	A4K25	0698-3438
A4CR10	1901-0040	A4K26	0698-3162
A4CR11	1990-0411	A4K27	0698-3260
A4CR12	1990-0411	A4K28	0757-0438
A4CR13	1902-0025	A4K29	0757-0280
A4CR14	1902-0025	A4K30	0757-0283
A4CR15	1901-0040	A4R31	0757-0442
A4CR16	1901-0040	A4R32	2100-2633
A4CR17	1901-0040	A4R33	0683-7545
A4CR18	1901-0040	A4R34	0686-1065
A4IC1	1820-0223	A4R35	0686-1065
A4IC2	1820-0223	A4R36	0757-0442
A4IC3	1820-0223	A4R37	0757-0442
A4Q1	1853-0012	A4R38	0757-0442
A4Q2	1854-0087	A4R40	0698-3457
A4Q3	1854-0087	A4R41	0698-3457
A4Q4	1853-0012	A4	07130-61410
A4Q5	1854-0087	A4 C21	0160-0168
		A4 R42	1990-0305
		A4 R43	1990-0305
		A4 R44	0683-1035

Figure 7-9. Preamplifier Board, Models 7132A, 7133A



ATTENUATOR SWITCH S1

Reference Designation	HP Part Number
A4S1	07130-61315
A4S1	310J-3297
A4S1R11	0698-6305
A4S1R12	0683-9135
A4S1R13	0698-6342
A4S1R14	0683-8235
A4S1R15	0698-6343
A4S1R16	0683-9135
A4S1R17	0698-6344
A4S1R18	0683-9135
A4S1R19	0698-6323
A4S1R20	0698-6362
A4S1R21	0698-6322
A4S1R22	0698-6320
A4S1R23	0698-6363
A4S1R25	0757-0200
A4S1R26	0757-0274
A4S1P27	0757-0416
A4S1R23	0757-0420
A4S1R29	0698-5672
A4S1R30	2100-3393
A4S1R31	0757-0261
A4S1Z	2190-0027
A4S2	2550-0043
	2100-3393

WF1



SCOPE  
AC MODE  
1 V/DIV  
1 MSEC  
LOW PROBE  
AT GROUND

RECORDER  
INPUTS SHORTED  
RANGE N/A (1V)

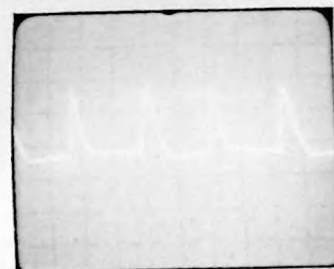
WF3



SCOPE  
AC MODE  
50 MV/DIV  
10 MSEC/DIV  
LOW PROBE  
AT GROUND

RECORDER  
INPUTS SHORTED  
RANGE 1V

WF5



SCOPE  
AC MODE  
10 V/DIV  
1 MSEC/DIV  
LOW PROBE  
AT GROUND

RECORDER  
1V DC INPUT  
1) VERN SW CW (OFF)  
2) PIN 3 ORN WIRE RE-  
MOVED OFF A4 PRE-  
AMP BOARD  
3) FULL SCALE VOLT-  
AGE AT INPUT TERM  
RANGE 1V DRIVING  
OFF SCALE





Reference Designation	HP Part Number
A7	07130-60830
A7C1	0160-0168
A7C2	0180-1819
A7C3	0160-0168
A7C4	0180-0137
A7CR1	1901-0040
A7CR2	1901-0040
A7CR3	1901-0040
A7CR4	1901-0040
A7CR5	1901-0040
A7CR6	1901-0040
A7CR7	1901-0040
A7CR8	1901-0040
A7CR9	1901-0040
A7CR10	1901-0040
A7CR11	1901-0040
A7CR12	1901-0040
A7CR13	1901-0040
A7CR14	1901-0040
A7CR15	1901-0040
A7CR16	1902-3071
A7CR17	1901-0022
A7CR18	1902-0078
A7CR19	1902-3071
A7CR20	1901-0040
A7CR21	1901-0040
A7CR22	1901-0040
A7CR23	1901-0040
A7K1	0490-1J88
A7Q1	1854-0071
A7Q2	1854-0039
A7Q3	1854-0039
A7Q4	1854-0039
A7Q5	1854-0071
A7Q6	1854-0039
A7Q7	1854-0086
A7Q8	1854-0039
A7Q9	1854-0067
A7Q10	1854-0039
A7Q11	1854-0071
A7Q12	1854-0071
A7Q13	1854-0039
A7R1	0757-0442
A7R2	0698-3637
A7R3	0757-0439
A7R4	0757-0449
A7R5	0757-0439
A7R6	0757-0449
A7R7	0757-0439
A7R8	0757-0449
A7R9	0698-3410
A7R10	0757-0439
A7R11	0757-0755
A7R12	0757-0420
A7R13	0757-0839
A7R14	0757-0401
A7R15	0698-3136
A7R16	0698-3157
A7R17	0757-0984
A7R18	0757-0438
A7R19	0698-3406
A7R20	0757-0401
A7R21	0757-0449
A7R22	0698-3410
A7R23	0757-0439

R. H.  
EVENT  
MARKER

REMOTE  
PEN  
LIFT

L. H.  
EVENT  
MARKER

REMOTE  
SPEED  
CHANGE

REMOTE  
ON-OFF

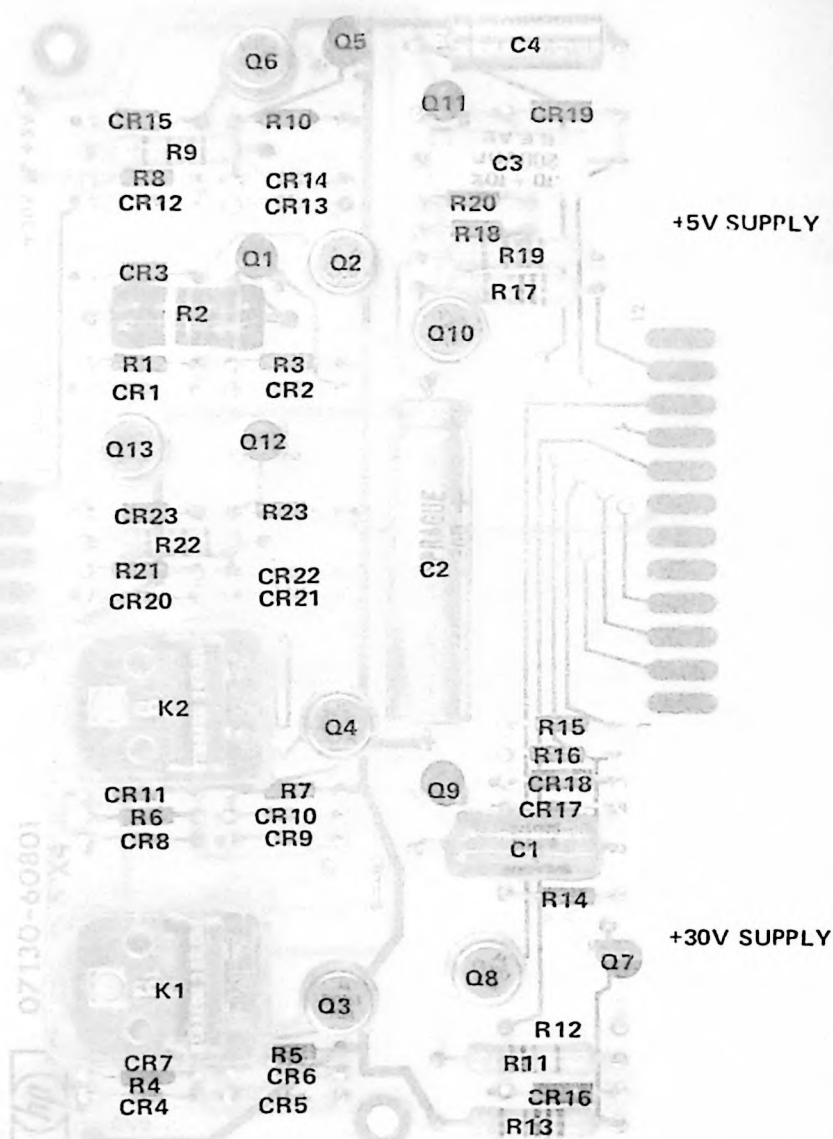


Figure 7-11. Remote Chart On-Off, Remote Pen Lift, Event Marker — Right (Option 037), Event Marker — Left (Option 537) Board, Models 7132A, 7133A



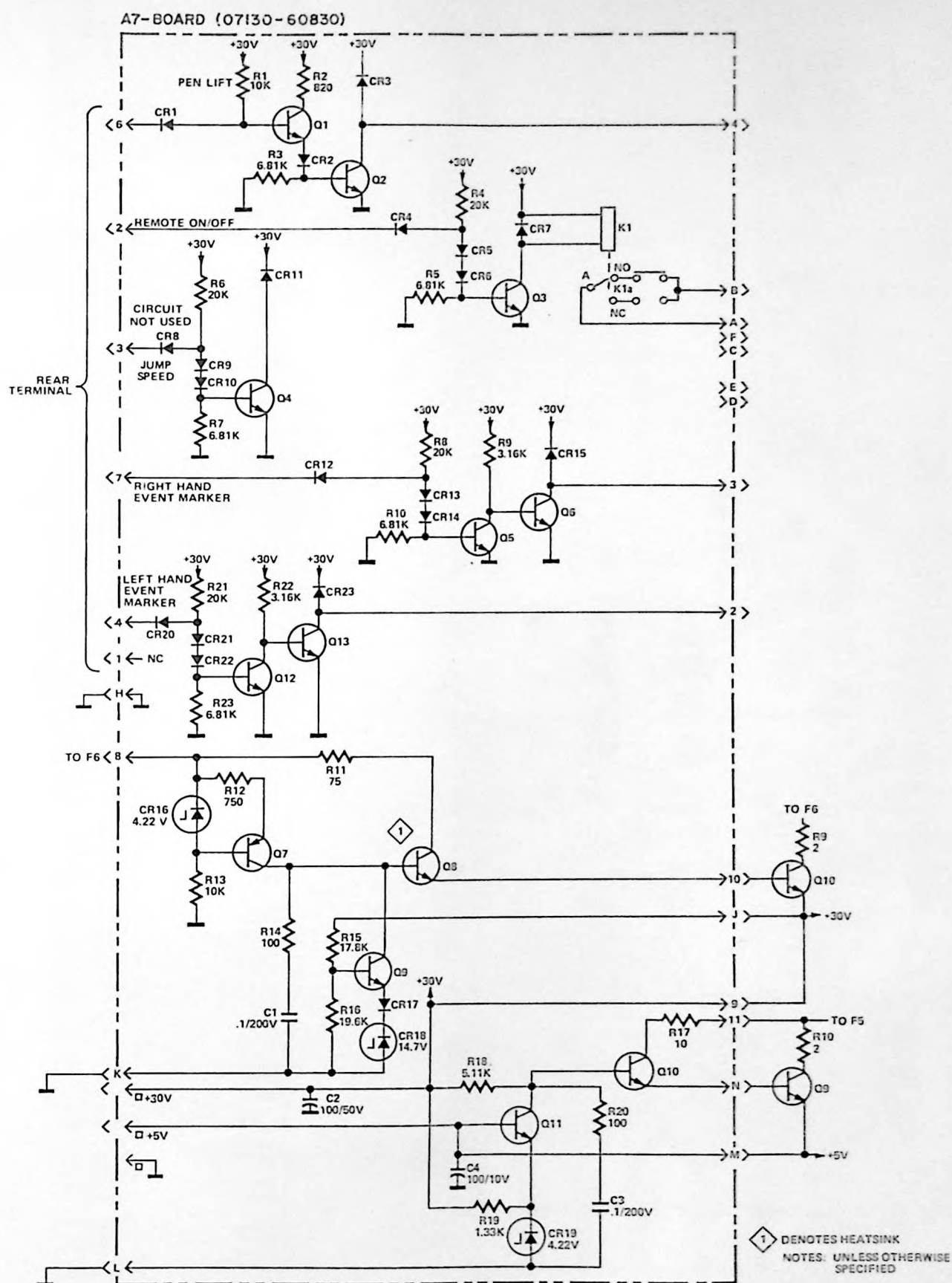
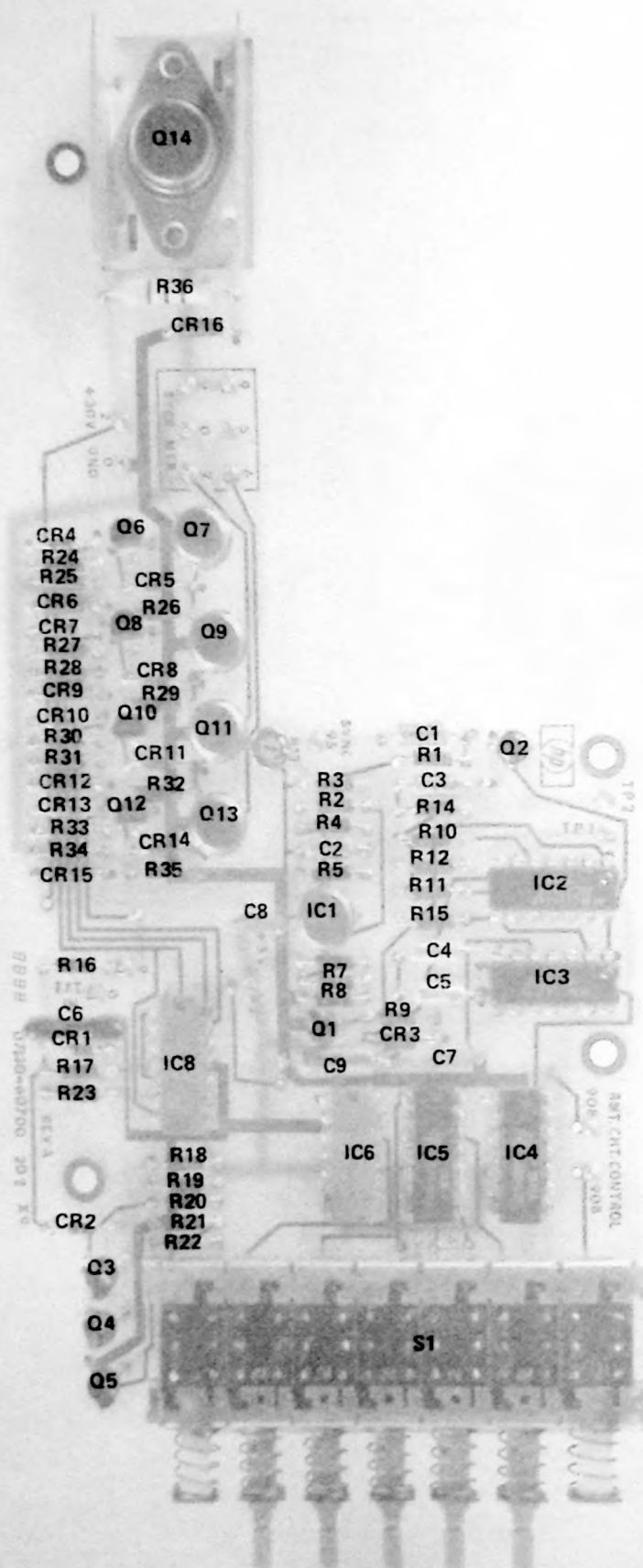


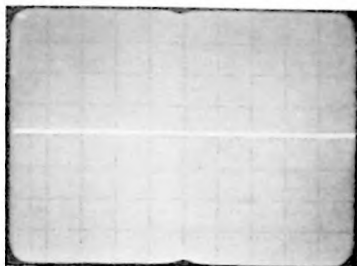
Figure 7-12. Remote Chart On-Off, Remote Pen Lift, Event Marker —Right (Option 037), Event Marker —Left (Option 537) Schematic, Models 7132A, 7133A



Reference Designation	HP Part Number
A9	07130-60700
A9C1	0180-0291
A9C2	0180-1743
A9C3	0180-0197
A9C4	0180-1745
A9C5	0180-1745
A9C6	0160-2215
A9C7	0150-0093
A9C8	0150-0093
A9C9	0180-C374
A9CR1	1901-C050
A9CR2	1901-0050
A9CR3	1901-0158
A9CR4	1901-C025
A9CR5	1901-0025
A9CR6	1901-0158
A9CR7	1901-0025
A9CR8	1901-0025
A9CR9	1901-0158
A9CR10	1901-0025
A9CR11	1901-0025
A9CR12	1901-0158
A9CR13	1901-0025
A9CR14	1901-0025
A9CR15	1901-0158
A9CR16	1902-3208
A9IC1	1820-C223
A9IC2	1820-0630
A9IC3	1820-0567
A9IC4	1820-0056
A9IC5	1820-0056
A9IC6	1820-0055
A9IC8	1820-0075
A9Q1	1854-0071
A9Q2	1855-0062
A9Q3	1854-0071
A9Q4	1854-0071
A9Q5	1854-0071
A9Q6	1854-0215
A9Q7	1854-0039
A9Q8	1854-0215
A9Q9	1854-0039
A9Q10	1854-0215
A9Q11	1854-0039
A9Q12	1854-0215
A9Q13	1854-0039
A9Q14	1854-0441
A9R1	0757-0461
A9R2	0698-3152
A9R3	0698-3152
A9R4	0757-0465
A9R5	0757-0283
A9R6	0757-0442
A9R7	0698-3449
A9R8	0757-1094
A9R9	0757-0438
A9R10	0757-0472
A9R11	0757-0472
A9R12	0757-0401
A9R13	2100-1788
A9R14	0757-0461
A9R15	0757-0280
A9R16	0757-0819
A9R17	0757-0290
A9R18	0757-0458
A9R19	0698-3152
A9R20	0698-0084
A9R21	0698-3447
A9R22	0698-3446
A9R23	0757-0438
A9R24	0757-0280
A9R25	0757-0280
A9R26	0757-0442
A9R27	0757-0438
A9R28	0757-0442
A9R29	0757-0438
A9R30	0757-0280
A9R31	0757-0442
A9R32	0757-0438
A9R33	0757-0280
A9R34	0757-0442
A9R35	0757-0438
A9S1	3101-0590

Figure 7-13. Eight-Speed Chart Drive Board, Models 7132A, 7133A

WF1



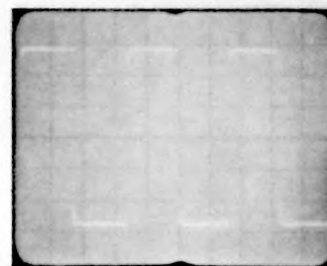
SCOPE

.1 V/DIV  
5 MSEC/DIV  
DC MODE  
+ PROBE ON TP-2  
- PROBE ON TP-1

RECORDER

ANY CHART SPEED  
ADJ R13 FOR NULL

WF2



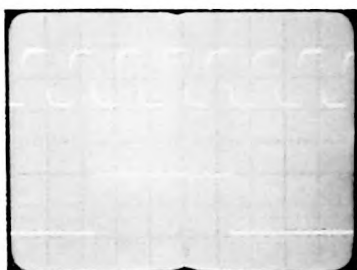
SCOPE

AC MODE  
5 V/DIV  
5 MSEC/DIV

RECORDER

ANY CHART SPEED

WF3



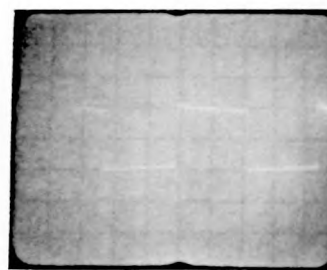
SCOPE

CHAN A 2 V/DIV  
2 MSEC/DIV  
CHAN B 2 V/DIV  
2 MSEC

RECORDER

AC MODE  
AC MODE

WF4



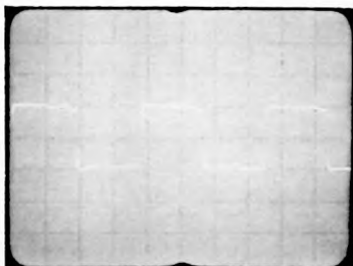
SCOPE

10 V/DIV  
50 MSEC

RECORDER

1"/MIN

WF5



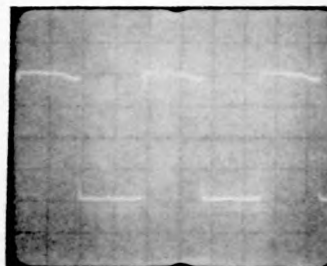
SCOPE

10 V/DIV  
10 MSEC

RECORDER

6"/MIN

WF6



SCOPE

5 V/DIV  
10 MSEC

RECORDER

6"/MIN

TO A1  
BOARD  
+30V

TO A1  
BOARD  
SYNC

EXT  
INPUT



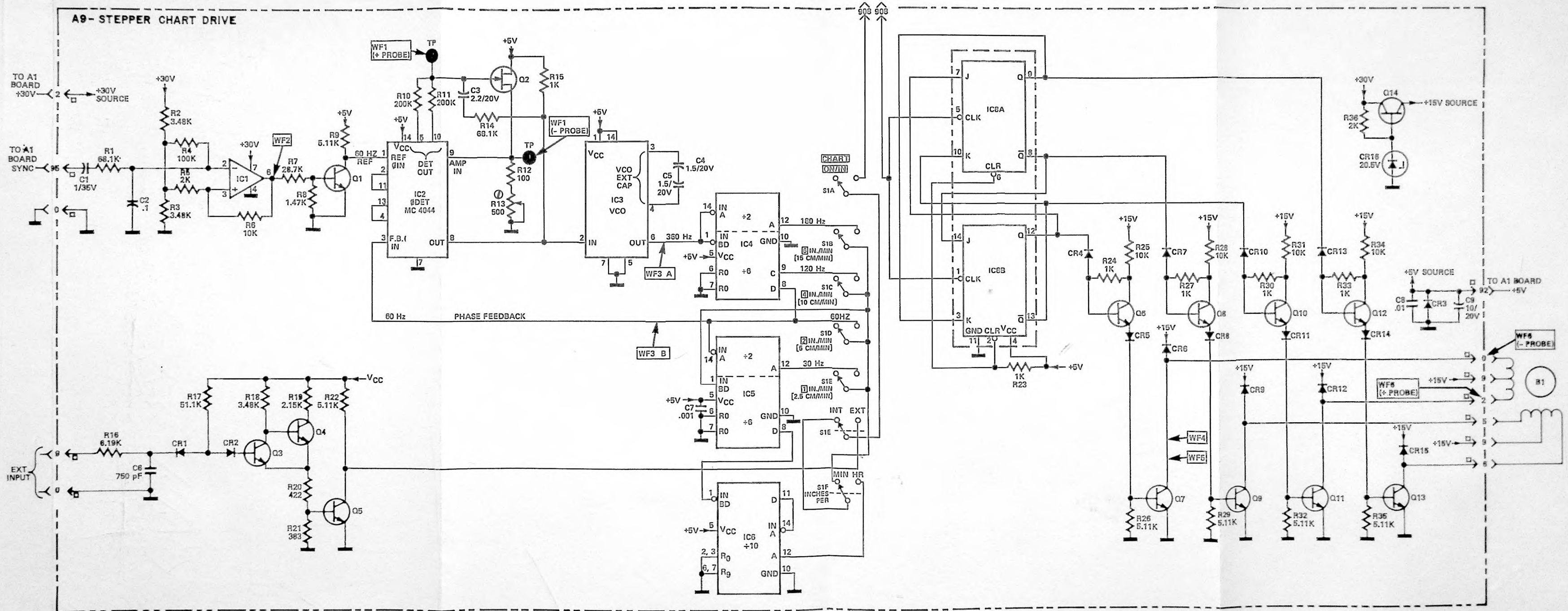


Figure 7-14. Eight-Speed Chart Drive  
Schematic, Models 7132A, 7133A

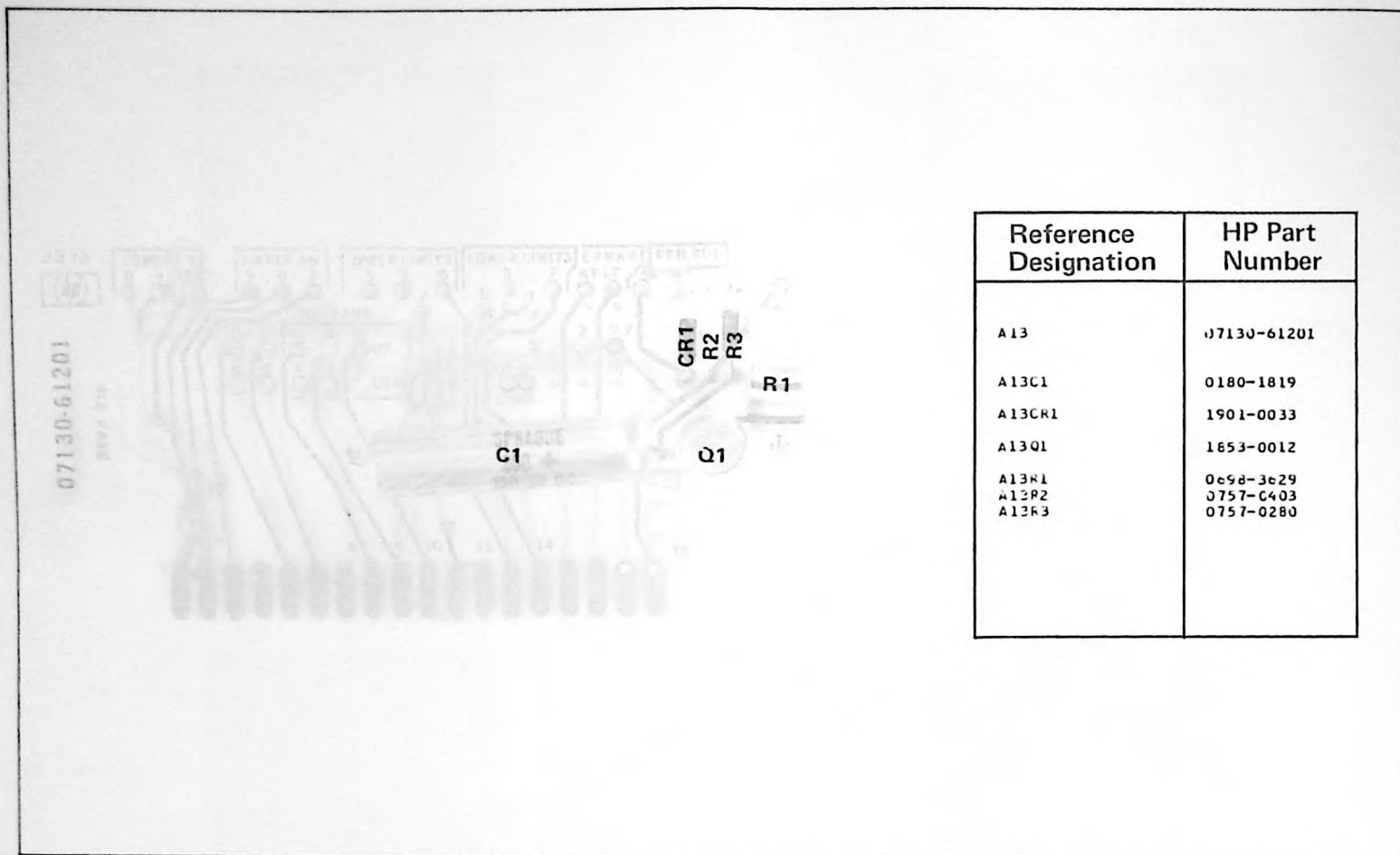


Figure 7-15. Remote Pen Lift Board, Models 7132A, 7133A

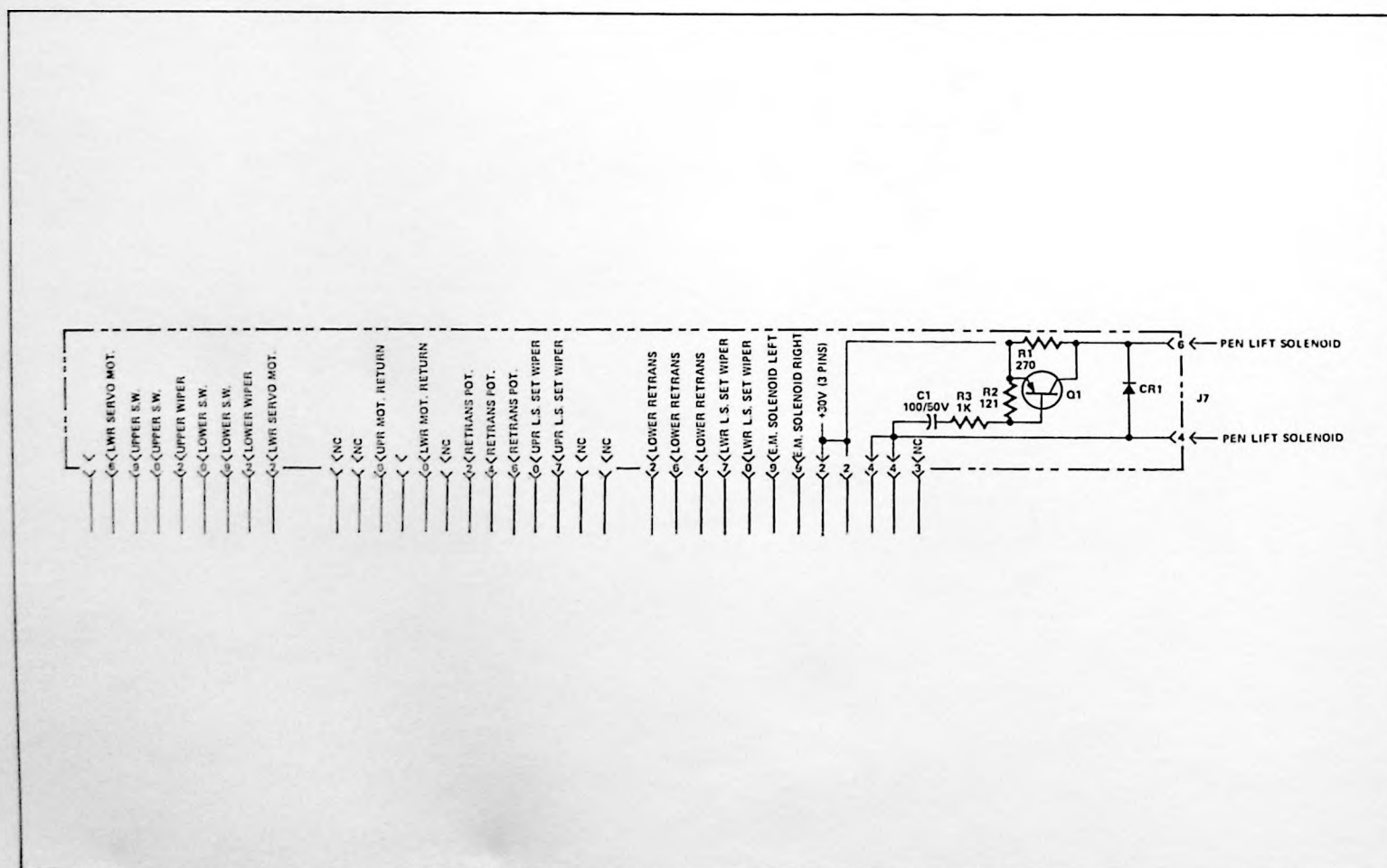


Figure 7-16. Remote Pen Lift Schematic, Models 7132A, 7133A

Table 7-1. Troubleshooting — Model 7132A

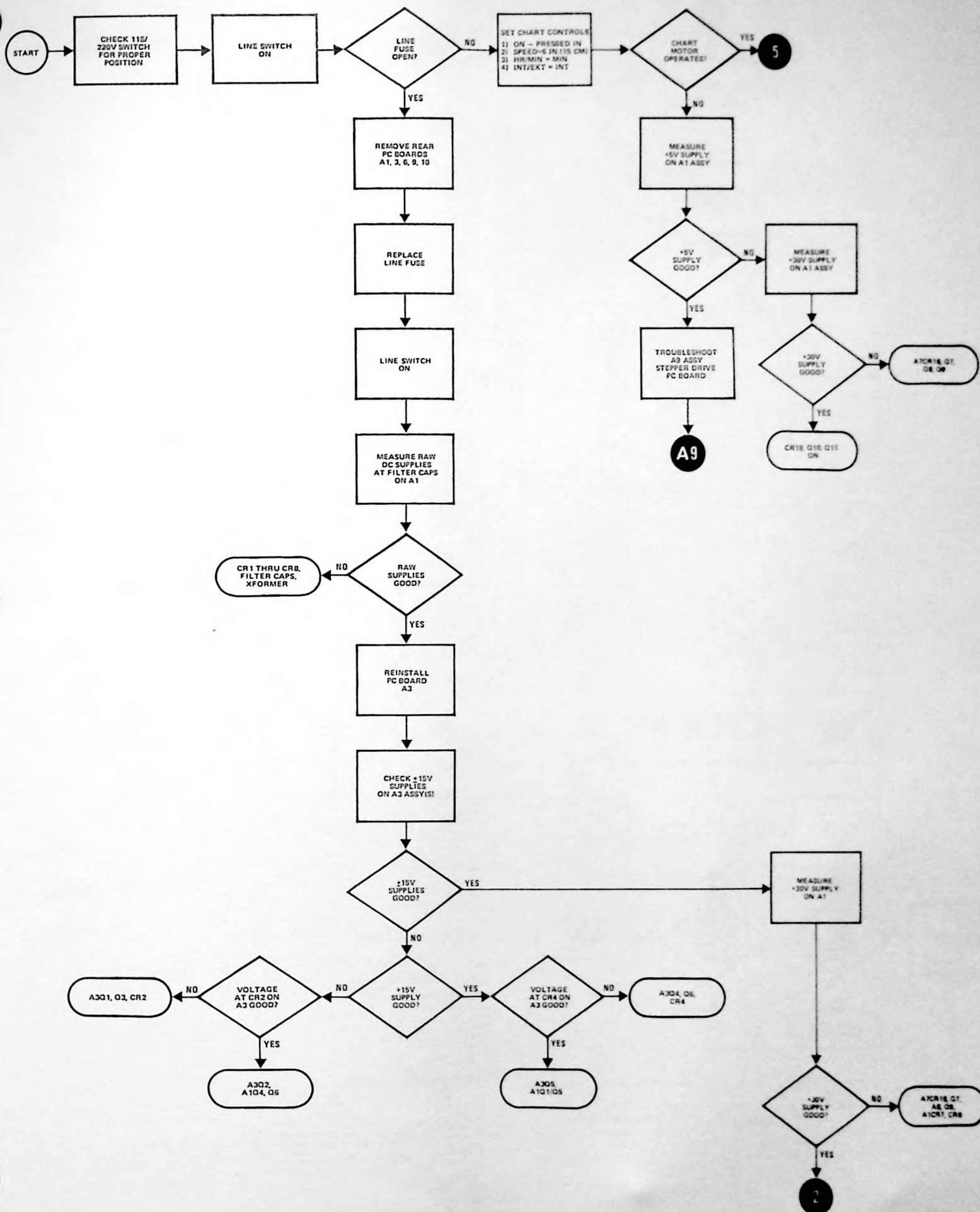




Table 7-1. Troubleshooting – Model 7132A (Continued)

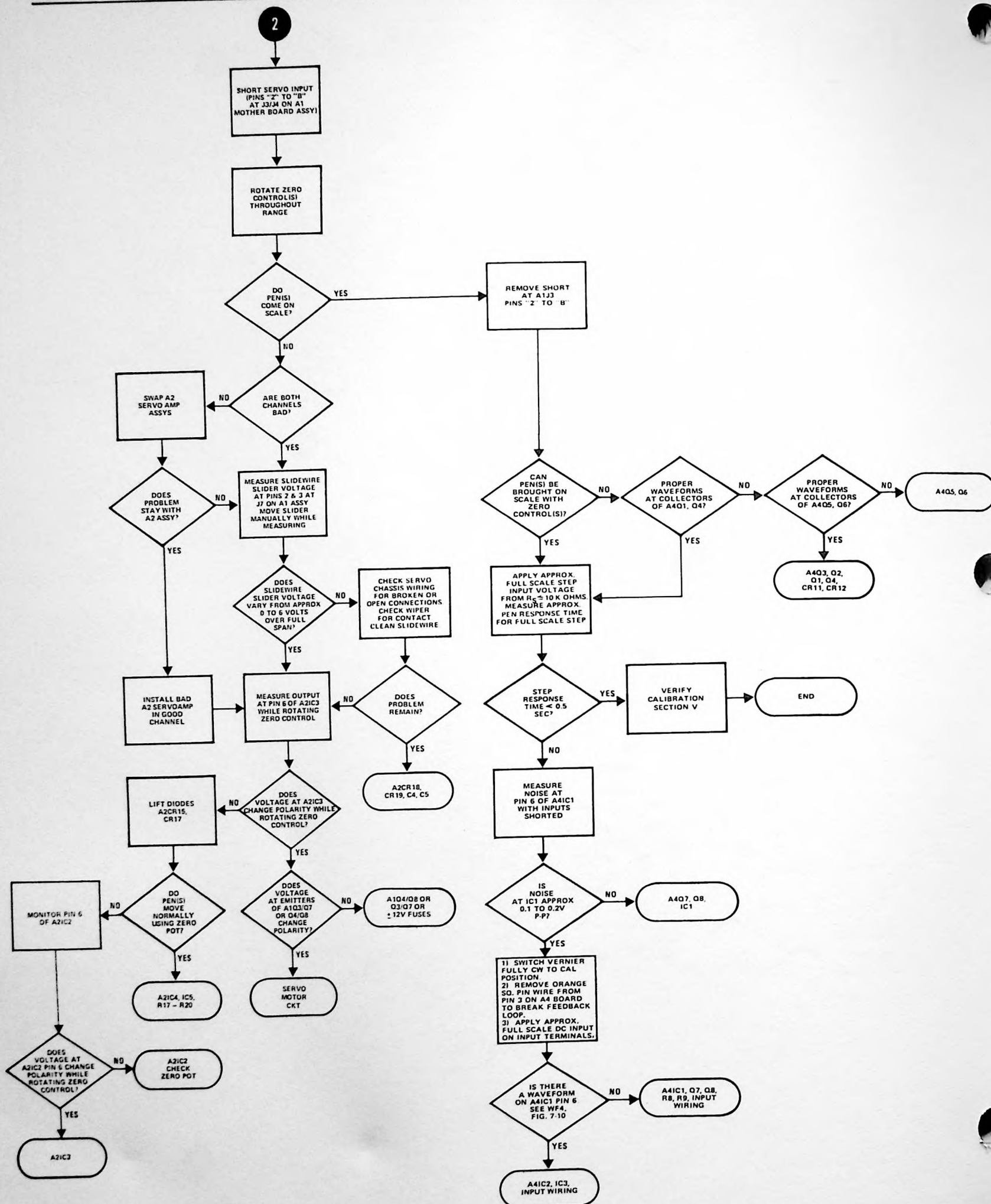


Table 7-1. Troubleshooting — Model 7132A (Continued)

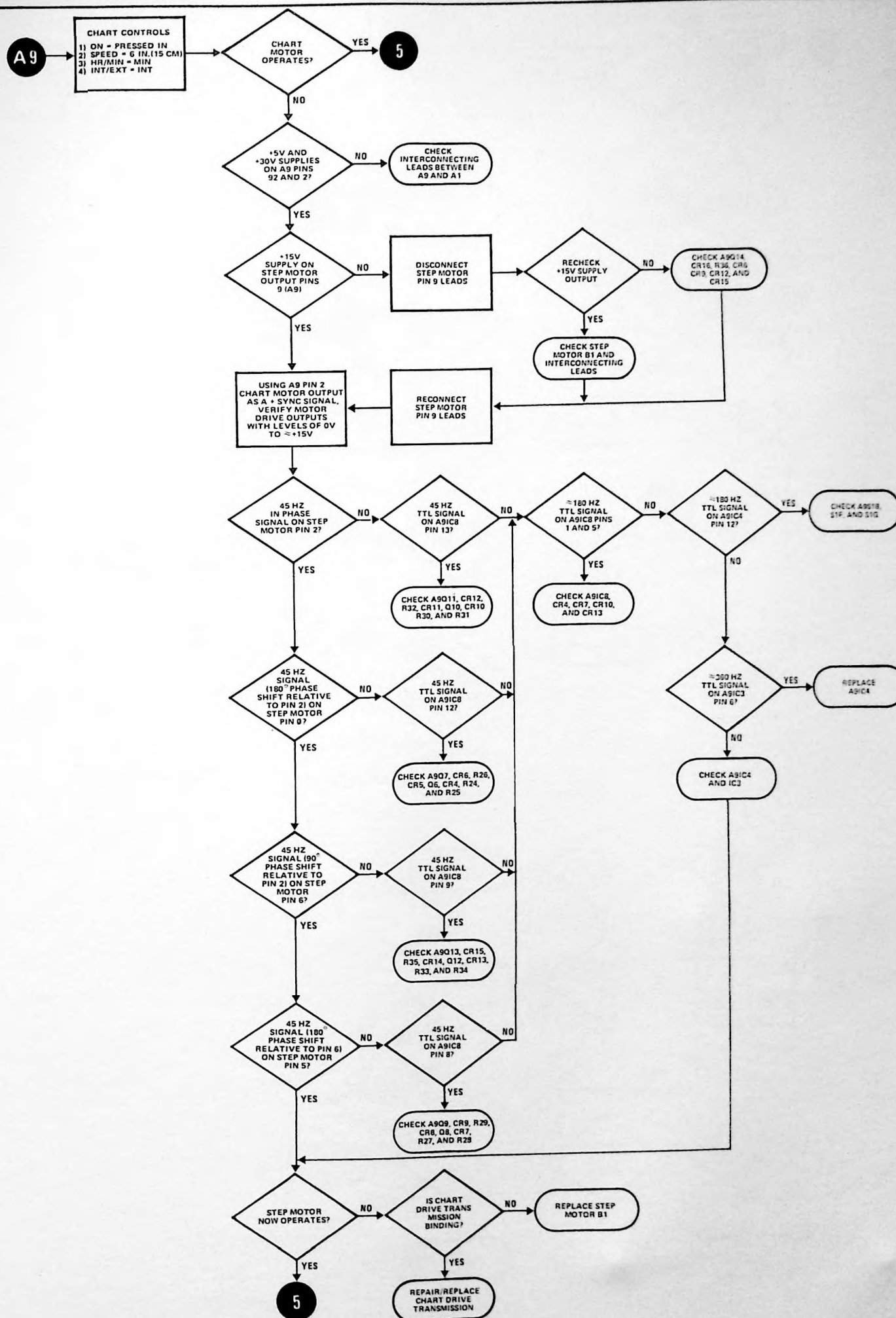


Table 7-1. Troubleshooting – Model 7132A (Continued)

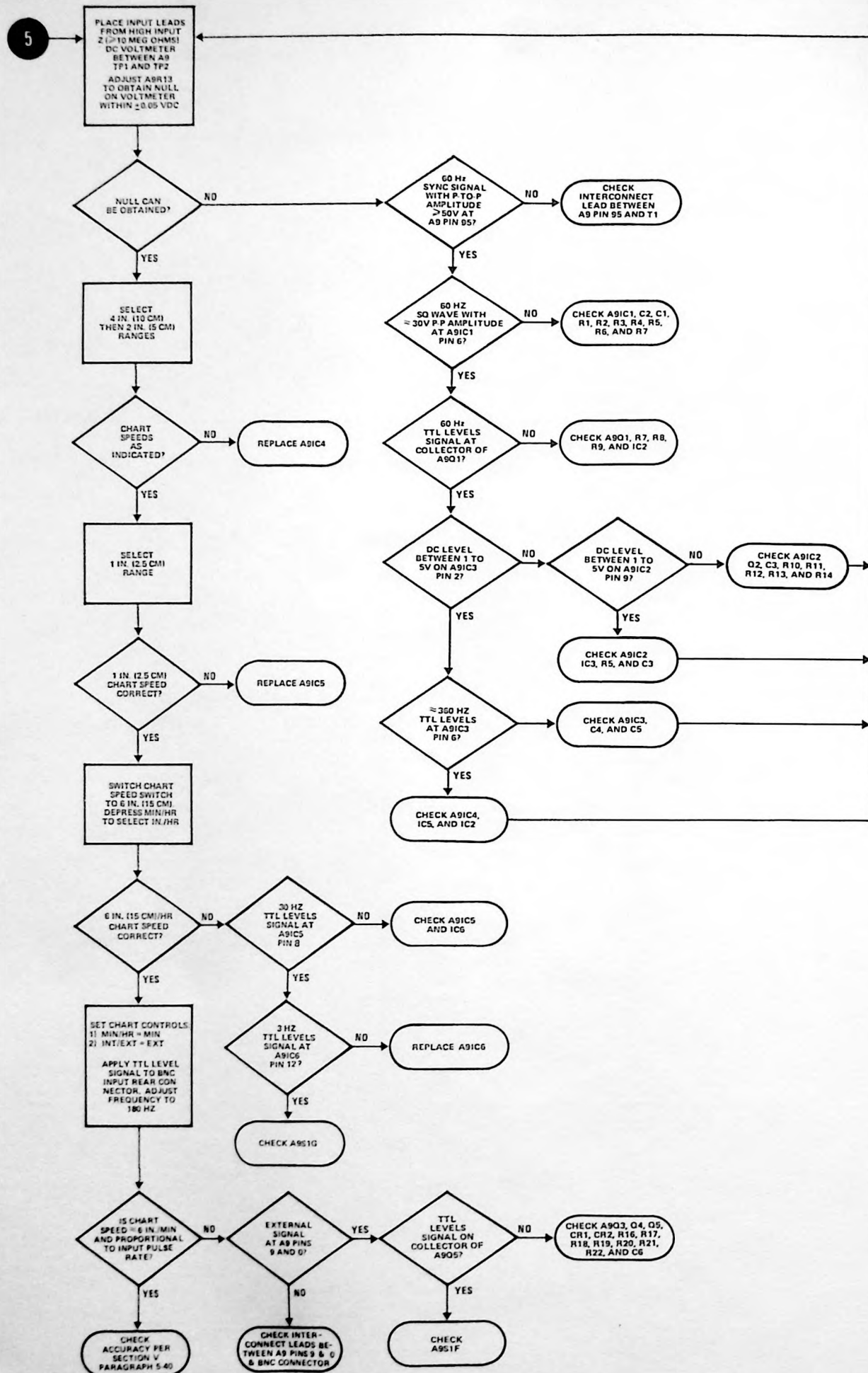




Table 7-2. Troubleshooting — Model 7133A

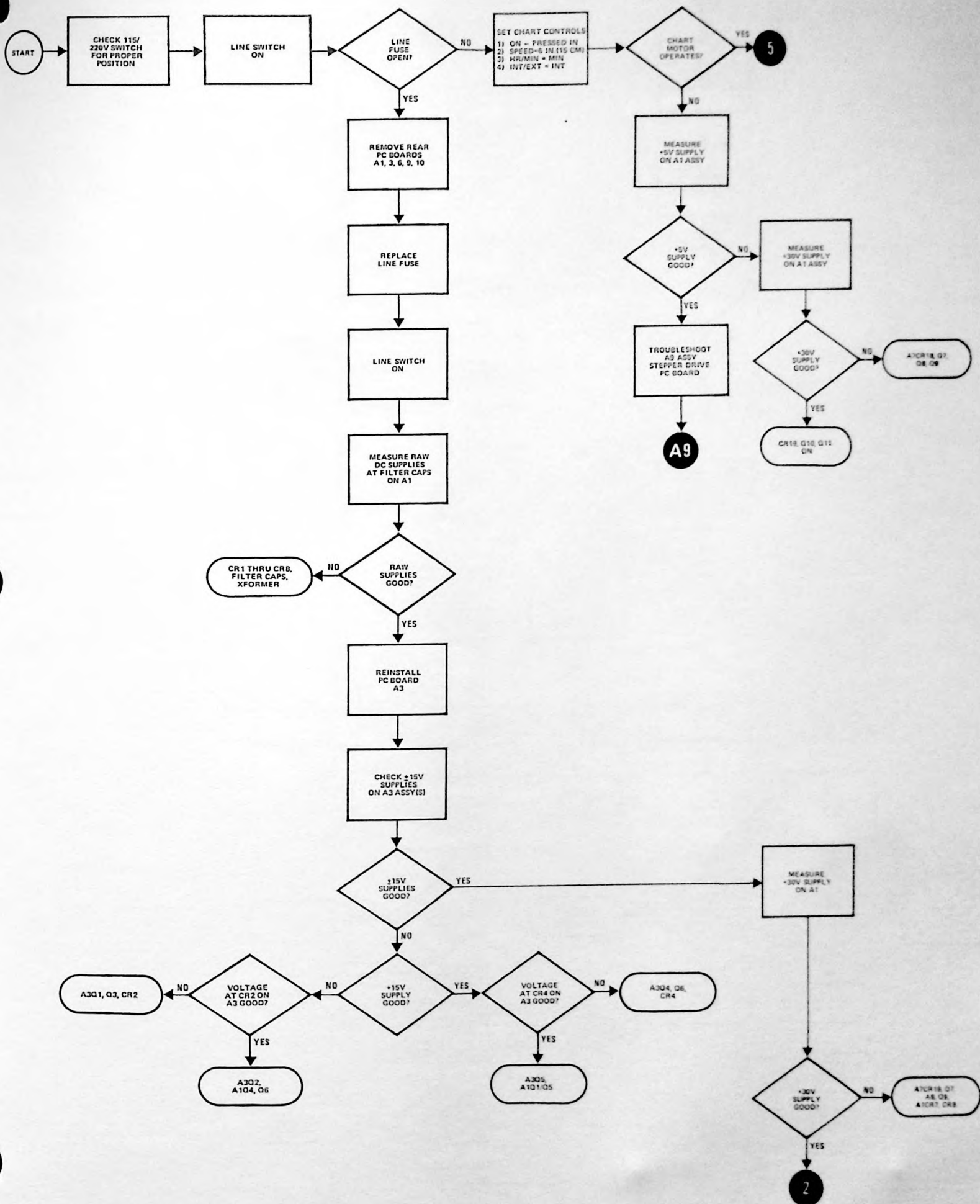


Table 7-2. Troubleshooting — Model 7133A (Continued)

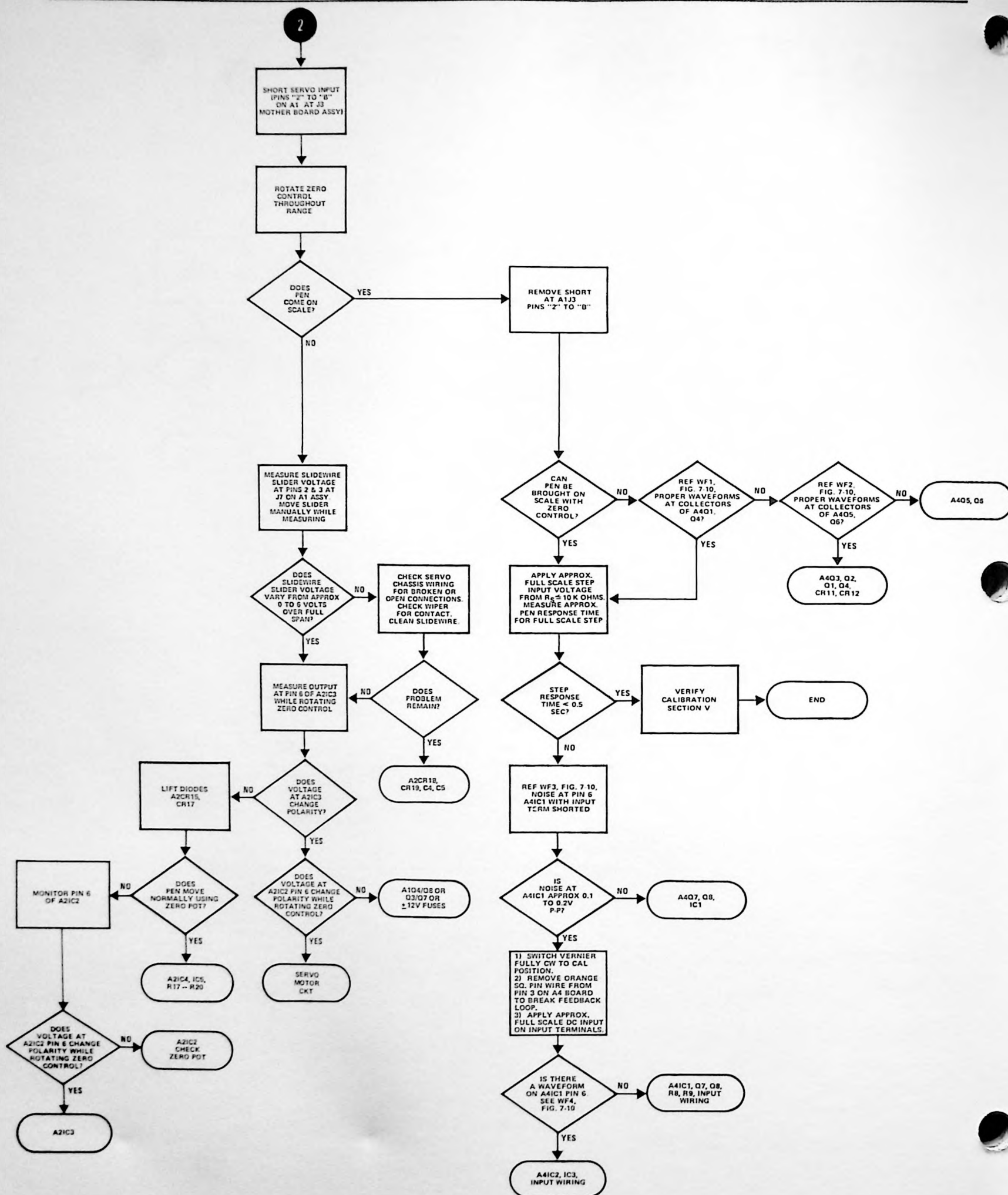


Table 7-2. Troubleshooting – Model 7133A (Continued)

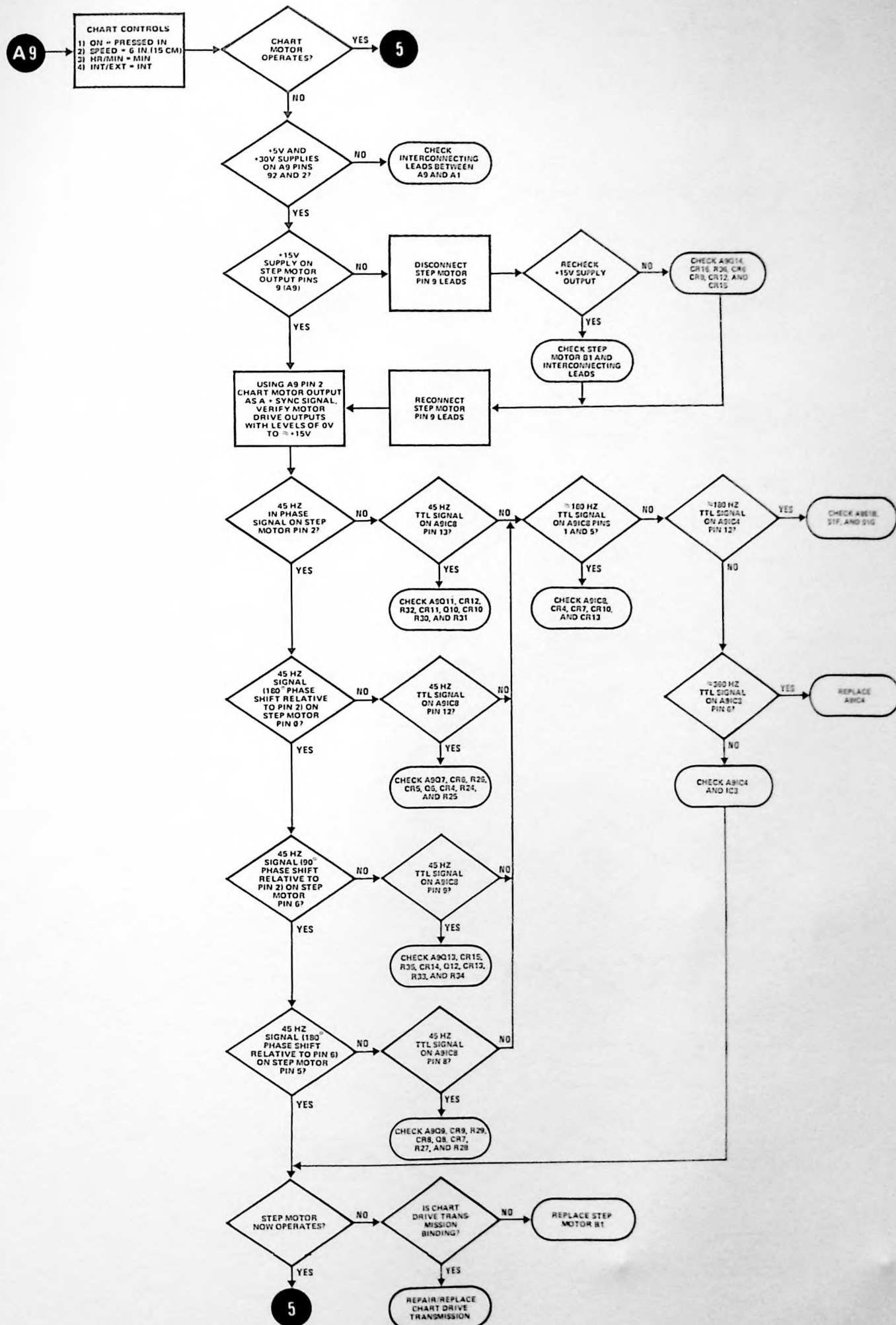
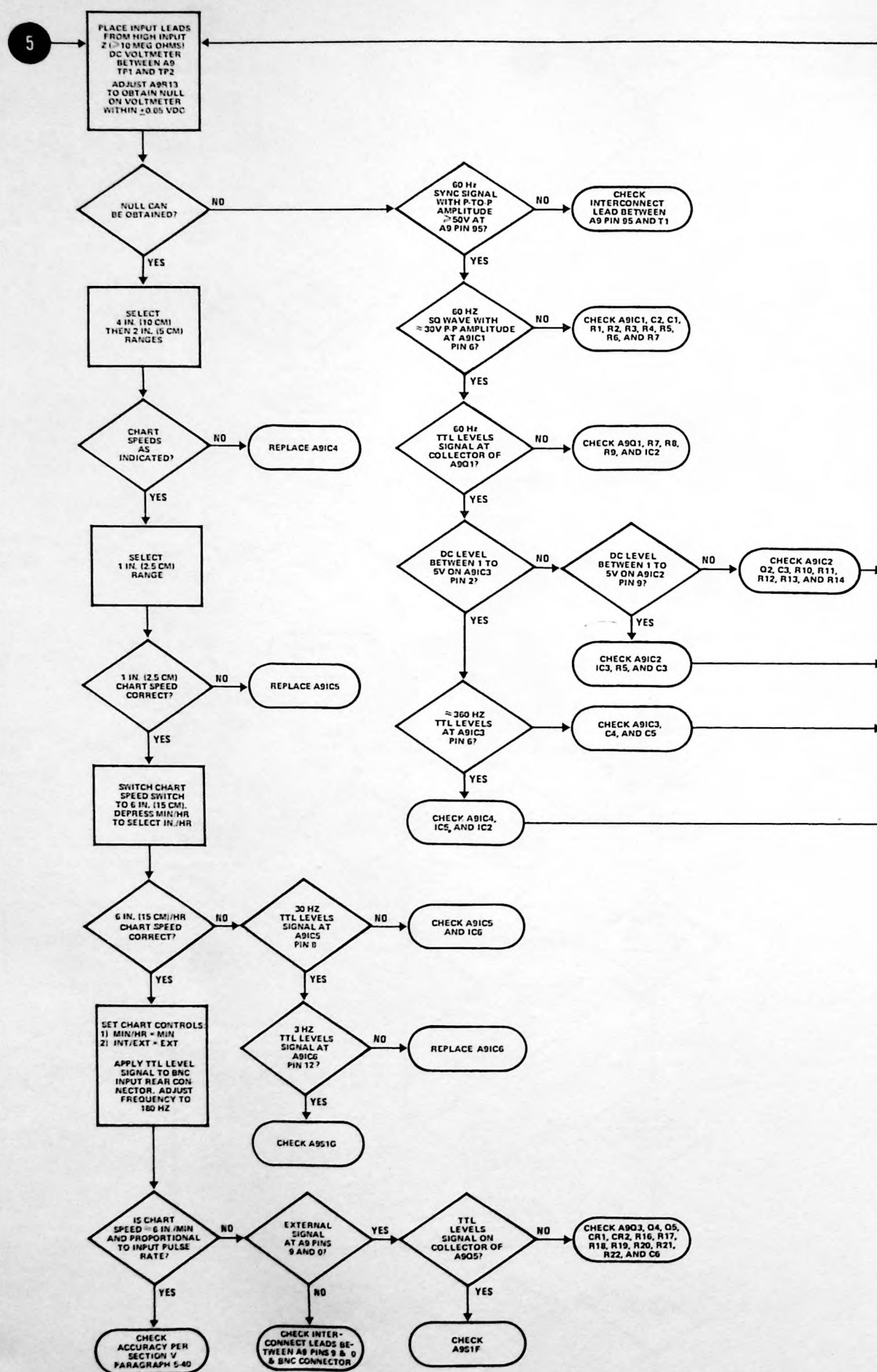




Table 7-2. Troubleshooting — Model 7133A (Continued)









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